VOLUME 2 NUMBER 8 AUGUST 1995

OS/2® MAGAZINE

Reviews
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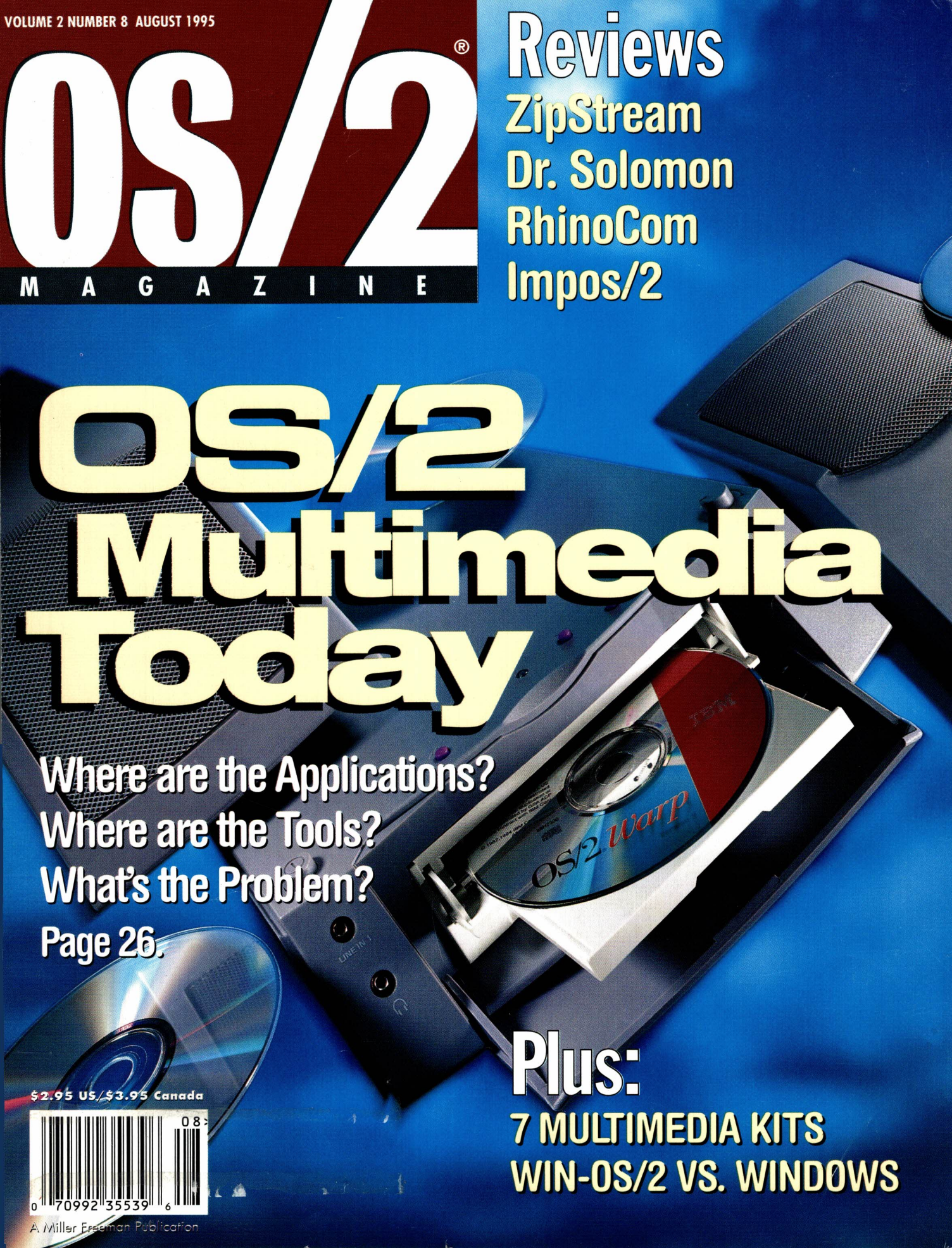
OS/2 Multimedia Today



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What's the Problem?
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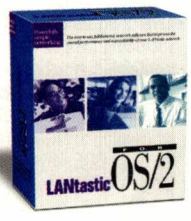

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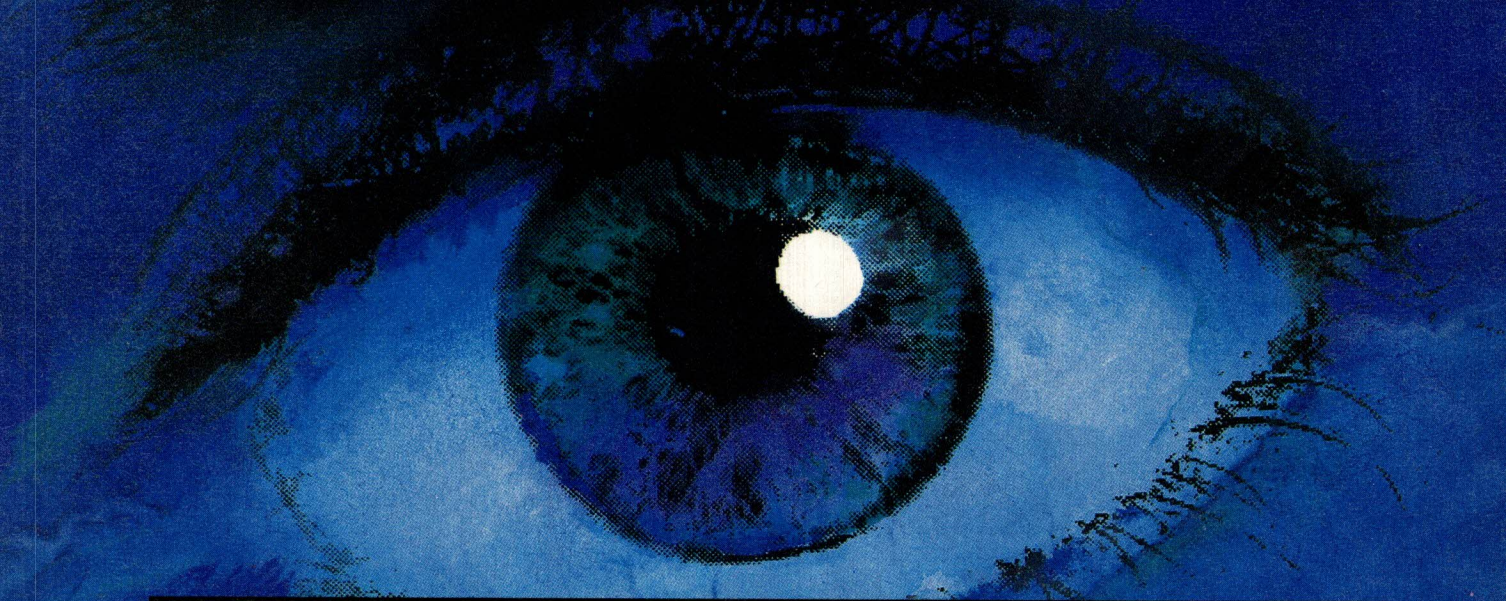

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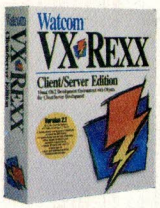

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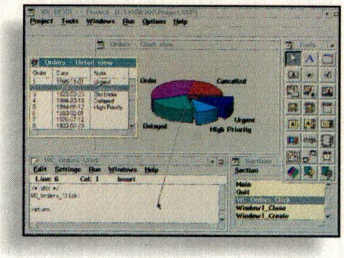

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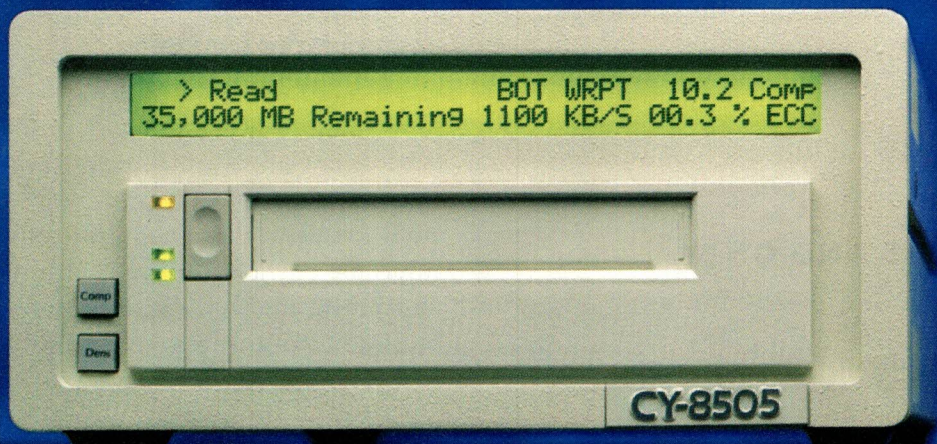

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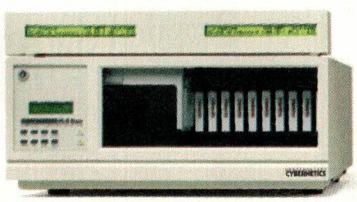

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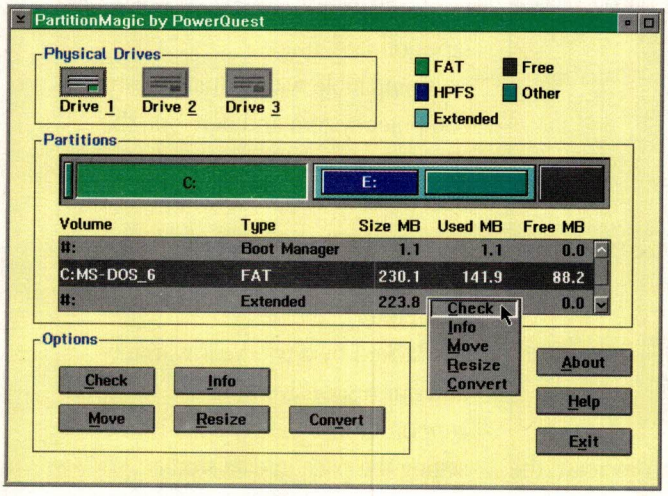

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Perspectives

Worlds in Collision

"All that negative flak is bull." That's according to Steve Mills, general manager of IBM's Software Solutions division, in response to press and analyst predictions that OS/2 will be killed in the near future. Software Solutions is responsible for the DB2 database product family, as well as many cross-platform applications and development tools such as Visual Age and C Set.

Mr. Mills and I had a chance to chat at May's DB/Expo conference in San Francisco—shortly after many of the major market-research firms predicted that OS/2 would be killed because it hasn't displaced Windows 3.x from the top of the heap, because it hasn't repaid IBM's investment, and because Windows 95 is coming.

"It's not the investment in OS/2 that counts," said Mr. Mills, dismissing the requirement that OS/2 return a profit as a stand-alone product. He also disputed my comment (June's *Perspectives*) that IBM must have its own operating system for each hardware platform: "It's not about the hardware," he insisted.

Instead, OS/2's survival is assured, he says, because major customers depend on it as a mission-critical platform. "Let's say a customer has spent millions developing a three-tiered client/server application, from desktop to server to mainframe. That application is critical to making that customer's business competitive. OS/2 is a key component in that application. It's inconceivable we'd pull OS/2 away from such customers."

Would that the rest of IBM stood so firmly behind their own flagship operating system as Steve Mills does: About a week later, the IBM PC Company announced its aggressive preload program for Windows 95. No wonder the business press and market analysts keep predicting OS/2's demise!

What's the deal? IBM is made up of many businesses, and their various business objectives are in conflict. The job of the PC Company is to sell hardware, and if they'll sell more hardware by embracing Windows 95, that's what they'll do—especially since they're struggling to return to profitability, and perhaps someday recapture their once-dominant position.

Most shareholders, especially institutional investors, don't want to hear about either OS/2 Warp *or* Windows 95 as long as IBM's share price grows and dividends are healthy—but heads would surely roll if the PC Company chose *not* to embrace Windows 95, and if their market share continued to decline. Knowing this, the PC Company is not only planning to preload Windows 95 on selected desktops and laptops, but also to provide customer support for it through IBM's Help Centers.

That's not all: IBM intends to create technical support teams to help Microsoft guarantee Windows 95's compatibility with IBM hardware. Will that be before, or after, they get OS/2 Warp running properly on the PC Company's entire product line, I wonder? The PC Company's announcement also says, "IBM...is working with Microsoft to ensure that only a stable, quality product is made available on IBM PCs." On the other hand, IBM Personal Software Products, the division that develops and markets OS/2, is counting on Windows 95 being an unstable, low-quality product. Isn't there a minor conflict here?

I'm glad not to be in charge of the IBM PC Company at a time like this. Their biggest competitors, like Compaq, Dell, Gateway 2000, and Packard Bell, don't make their own operating systems (Hewlett-Packard tried, and failed: Remember NewWave?), and can focus on selling computers without their corporate egos or other divisions' marketing efforts getting in the way—for them, an operating system is just another component to be bought and bundled.

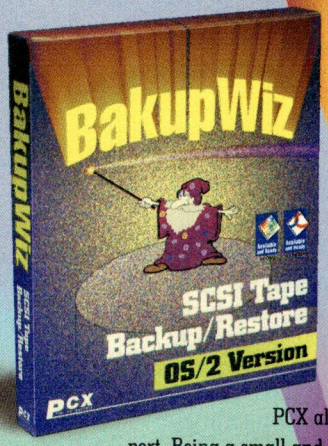
I'm also glad not to be managing Personal Software Products. Their fortunes are tied to the success (read: market share and volume shipments) of OS/2. That's why there's the Seussian "one-box/two-box/red-box/blue-box" push to have a flavor of OS/2 Warp for every market slice. But the PC Company keeps undermining PSP's efforts, first by dragging its feet for years on preloading OS/2 on its systems, and now by helping its arch-competitor, Windows 95, to the extent of actively helping Microsoft improve the product.. So, what do we have?

- IBM Personal Software Products is trying to build volume by marketing OS/2 Warp as a consumer operating system.
- IBM Software Solutions is using OS/2 as a strategic tool to sell client/server products like DB2.
- IBM PC Company is preloading Windows 95, and helping Microsoft improve it, to sell more hardware.
- IBM shareholders are demanding steady growth in revenue and profits.

IBM top management's attempts to unravel this sticky internecine situation without hurting either OS/2 or the PC hardware business should be interesting to watch, folks.

Alan Zeichick
Editor-in-Chief

P.S.: Please join me in welcoming *OS/2 Magazine*'s newest columnist, Wayne Rash, Jr., a network expert who also writes reviews and opinions for *Communications Week*. "The Network Connection" debuts this month on page 59.



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Members of the PortaTape series utilize a range of SCSI tape drives including 1/4 inch, 4mm, and 8 mm mounted in low profile external enclosures. Connection to the host system is via the system's parallel printer port, which may be utilized concurrently with tape drive operation. A copy of OS/2 BakupWiz is included with each PortaTape.

PCX also markets a complete line of standard SCSI tape backup units ranging in capacity from 250mB to over 10gB. Available in both internal and external models, these units are priced from $550. For very large backup needs, PCX offers robotic tape loader mechanisms from 48gB to over 1 terabyte.

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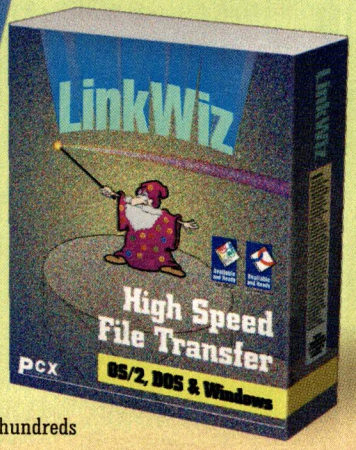

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Letters

"If one truly does not need multitasking, one ought to stick with good old DOS!"

FixPak Advice

Dear Editor:

Alexander Antoniades states in Dateline: OS/2 (June 1994, p. 11) that "as with all OS/2 fixes, make sure that this FixPak addresses problems that you have and don't install it simply as a matter of course." Generally speaking, I agree with his statement, but I would encourage everyone to apply this fix even if they have not experienced a particular problem. I say this because of the statement that is included in the FixPak's *readme* file: "This FixPak will be a prerequisite to all future OS/2 Warp 3.0 FixPaks."

This FixPak brings OS/2 Warp to the equivalent of the OS/2 Warp FullPack and is a necessary step in preparing for any future FixPaks. I would, therefore, recommend installing it as a matter of course.

Gary Pool

Dear Editor:

I found out today that the FixPack for OS/2 Warp addresses problems that are associated with running Norton Desktop under Win-OS/2. In fact, the Norton Desktop for Windows even makes the network connection of LANtastic for OS/2 to other machines correctly.

Bruce Bennett

In defense of OS/2

Dear Editor:

I am responding to a letter by Phillip Slater, Jr. that was printed in the May 1995 issue (p. 9). More independent software vendors (ISVs) support Windows than OS/2 simply because the Windows market is much larger, which is due, for the most part, to the now outlawed Microsoft OEM deals that ensured that Windows was preinstalled and configured on virtually every new PC—whether the buyer wanted it or not. These deals very effectively squashed any competition from other operating systems. Needless to say, IBM's non-marketing and nonsupport of OS/2 has not helped. Only recently, with the OS/2 Warp campaign, has IBM shown *any* attempt at marketing the product outside the corporate environment.

Regarding Mr. Slater's comments about configuring peripheral devices, I have installed OS/2 Warp on a number of machines and have had *no* problems adding or changing components. I simply ensure that my peripheral devices are supported by OS/2 Warp *before* I buy them, which is no big deal, because OS/2 Warp supports almost all of the better-known higher-quality devices. In addition, I know several people who have installed and configured OS/2 Warp and added peripherals without problems.

Before I started using Windows, I took the time to learn a little about it. My Windows experience benefited. I did the same with OS/2 and have had good results. It is important to remember that, although OS/2 runs DOS and Windows programs, it is very different from DOS/Windows! A little preparation goes a long way.

Many tests of operating systems have shown that OS/2 does not run Windows programs as fast as DOS does. However, it has also been shown that Windows does not run DOS applications as fast as DOS. In both cases, applications that were designed to be single tasking or cooperatively multitasked are being operated in a preemptively multitasked environment. Naturally, they will suffer a slight speed deficit. OS/2 allows the user to forego preemptive multitasking to a considerable extent with an adjustment of the IDLE settings for the DOS/Windows program object. The result is speeds closely approaching native DOS or Windows at the expense of multitasking performance.

I have worked with many novice computer users and do not agree that Windows is the easiest system to learn. The Macintosh OS is the easiest—hands down! And, although it might be tougher to learn to configure OS/2, because of its complexity, it is easier to learn to use than Windows. In addition, I know from experience that many people perform only one task at a time on their Windows computers, because in many cases that is all Windows will permit. If they *could* multitask, they would. I've learned how! And, finally, if one truly does not need multitasking, one ought to stick with good old DOS. Many fine DOS programs are available today that provide a user interface that is just as easy to use as Windows. For example, WordPerfect 6.0b. And, these programs won't give you UAE or GPF errors as Windows does or load up other program directories with untold megabytes of DLLs, and so on.

I installed OS/2 Warp on my computers at work, at home, and on my laptop and have no intentions of throwing in the towel unless someone comes up with a desktop operating system that is more reliable, has better multitasking, is easier to use, is more robust, and more memory and disk-efficient.

Tim Howey

Dear Editor:

The letter by Philip Slater, Jr. (May 1995, p. 9) cries out for a rebuttal. I won't even bother to respond to all of the nonsense about OS/2 Warp's difficult installation and maintainence. But, in my experience, his statements are simply not factual. What I do find amusing, though, is his last paragraph in which he states: "how many of us really need it [multitasking] and aren't just fooling ourselves? Most people only do one thing at a time. So, what if my computer does the same?"

Well now, I learned how to read in the bathroom when I was just a little tyke and I do enjoy eating a piece of cake while watching TV. Why, I have even learned how to walk and chew gum at the same time.

Vern Paulson

Send the Bonus Paking

Dear Editor:

I read Alexander Antoniades' May column (May 1995, p. 11) with mild interest. His criticisms of IBM and their Bonus Pak only paralleled my own experiences. After trying out all of the software on the Bonus Pak, I found it necessary to reformat my OS/2 partition and reinstall OS/2 Warp. It was the only way to be absolutely sure that none of the software left any garbage on the disk or *config.sys* file.

I was especially disappointed about CompuServe Information Manager (CIM) for OS/2, as I'd already been using both a DOS and Windows version. The OS/2 CIM upgrade that was released earlier this year still did not function correctly and so it was eliminated. The only bit of software from the Bonus Pak that I currently use is the IBM Diagnostics program. IBM Works was okay, but a poor contender when compared to WordPerfect 6.0b/DOS, Paradox 4.0/DOS, and Quattro Pro 5.0/DOS. I am evaluating Lotus SmartSuite for OS/2 version 2.

I generally detest Windows because so much of the software has work-arounds that result in software incompatibilities.

Ironically, it was the problems with the software in the Bonus Pak that pushed me to invest in more Windows software. I generally detest Windows because so much of the software has work-arounds that result in software incompatibilities that require the three-finger salute to close down or a complete system reboot. At least under OS/2 Warp I only have to close Windows—at worst. I bought OS/2 2.11 for the multitasking capabilities and upgraded to OS/2 Warp because of the inherent speed increase.

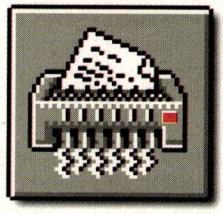
If I have one major complaint, it is the changes in user interfaces that one sees in applications when moving from one operating system to another, for example the different interfaces of Lotus 1-2-3. Using these programs is becoming increasingly intuitive, but consistency throughout a product line would be a real plus.

Michael J. Reeves

Even though you've given up on the Bonus Pak, some updates are in the works and should be available by the time you read this issue. Look for another update to OS/2 CIM on CompuServe. Some bug fixes for IBM Works should also be made available by IBM.

—Alexander Antoniades

The Best Time to Get Back Again/2



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Reader Service No. 6

New Applications, New Resellers—Someday

NEW PROGRAMS SHOULD HELP DEVELOPERS TO PORT THEIR SOFTWARE TO OS/2 AND MARKET IT ONCE THEY'RE THERE. BY ALEXANDER ANTONIADES

One of IBM's principal methods for spreading the OS/2 gospel has been through the series of developer conferences that are known as the Technical Interchange. In previous years, IBM's Personal Software Products division hosted as many as five conferences in different locations across North America. This year, IBM decided to hold only one event in late May. Another departure from the Technical Interchange's usual approach was that OS/2 wasn't the only operating system that was featured. IBM's strategic operating systems, AIX, OS/400, and MVS were also included to bolster OS/2's position as a cross-platform solution. The content of more than 600 classes varied from valuable technical and marketing information to thinly veiled sales pitches for IBM products.

The mood was upbeat during the opening keynote session and throughout the conference. Unlike past events, where the tone was more "rah! rah!," this year's mood was less "I think I can, I think I can," and more "look what we've done." For example, the opening multimedia pep rally, which in the past was a Technical Interchange fixture, was postponed until the end of the conference. Touting the latest OS/2 sales figures as "nine million and growing," IBM feels it has clearly demonstrated OS/2's viability and is now concentrating on making it easier for more developers to come on board.

Touting the latest OS/2 sales figures as "nine million and growing," IBM feels it has clearly demonstrated OS/2's viability.

Developer API extensions

The Technical Interchange was long on technology, but short on announcements from IBM. One of IBM's few announcements was a new piece of technology called the Developer API Extensions (DAX) for OS/2.

Most high-end graphical-user-interface-based operating systems, such as OS/2 Warp, Windows NT, and Windows 95, have many low-level programmer functions in common, such as Open a window or Spawn a thread. Unfortunately, due to different evolutionary histories, these operating systems' Application Programming Interface (API) calls are often written differently, although the same function will be performed.

Due to similarities in the architecture of OS/2 and Microsoft's Win32 API (which is used in Windows NT and Windows 95), IBM came up with a list of more than 700 APIs that are virtually identical in the two operating systems. By using a special header file to change the name of the Win32 call to the appropriate OS/2 call and extending some of the OS/2 APIs to include some popular Win32 calls, IBM developed some tools that will allow Win32 and OS/2 programs to share 80% of the same code. That 80% is for common functions. The leftover 20% is for functionality that is specific to one operating system and not simply translated from, say, a Win32 API to an OS/2 API.

The DAX program is intended to expand the OS/2 market by making it easier for vendors to use one common source code base—written with Win32 APIs—that can be recompiled for Windows or OS/2. How was it received? With both praise and skepticism. For one thing, the figure of 80% shared code is an estimated average. Programs that are tightly integrated into parts of Windows that aren't supported by this API set, such as OLE2 and multimedia, will still be hard to port to OS/2. Also, it's unclear how much this common-code-base approach will actually benefit OS/2 when identical applications will be available on the presumably more abundant Windows 95.

OS/2 software developers were understandably of two minds about this development. On the one hand, any expansion and opportunity for

growth in the OS/2 marketplace is good for nearly everybody (although some vendors were upset about IBM's opening the door to increased competition in the applications market). On the other hand, nobody, especially developers who have invested significant effort in learning the native OS/2 APIs, wants native OS/2 programming to be relegated to second-class status just to get some big name Windows applications to come over to OS/2. And, it raised more confusion about how IBM expects people to develop for OS/2, because this Win32-centric approach directly conflicts with IBM's Open Class Library.

Lotus Development Corp., one of the largest independent OS/2 software vendors, showed no confusion amidst all the turmoil. Lotus worked closely with IBM to develop DAX to help move SmartSuite and other applications to the common code base that they have preached about for so long.

This technology, like all of IBM's other attempts to offer easy Windows-to-OS/2 migrations (such as One Up's SMART and Micrographic's ill-fated Mirrors products), will ultimately depend less on technical feasibility and more on market viability. Unfortunately, this news did little to encourage developers who already believed in the viability of the market and had developed programs under OS/2. Now, they believe that IBM is more interested in evangelizing to Windows developers than in supporting the already devout OS/2 developer congregation.

WarpWare

So, you've written your shrink-wrap application using OS/2's native API calls or DAX. Now, how are you going to get it into the retail channel? In the past, developers have either had to go it alone (a process made easier if they already had best-selling DOS or Windows applications in stores) or through the all-volunteer OS/2 Vendor Council. Now, you will have a third option.

Blue Orchard, a spin-off of the mail-order reseller Indelible Blue, will market blocks of OS/2 applications in a bid to get more shelf space for OS/2 software. The idea is that, under their new WarpWare banner, Blue Orchard will broker a group of OS/2 applications between the software companies and distributors, causing OS/2 sections in leading computer retail stores to be formed. It's far too early to tell if Blue Orchard will be successful in promoting OS/2 applications in this manner. Other organizations, such as the OS/2 Vendor Council, have had limited success in previous attempts.

Other trends

Apart from these two announcements, the Technical Interchange was pretty quiet. On the show floor, OS/2 vendors seemed to be warming to the PowerPC. About a quarter of the booths sported products that ran the latest beta of OS/2 for the PowerPC (although many independent vendors seemed only too pleased to demonstrate graphics glitches and other bugs in the OS/2 beta). IBM will need much more than that to make this new hardware platform successful.

IBM's Visual Basic clone, code-named Bart, also made an appearance. This tool and its Macintosh-based companion, Denali, should move Microsoft's Visual Basic language into the cross-platform realm. Besides reading existing Visual Basic programs, Bart, in alpha at the Technical Interchange, will also use existing VBX controls and control OpenDoc parts. The question is, of course, when will it be finished?

Most of the exhibitors were holding off on major new OS/2 products until IBM can define a clear strategy for existing OS/2 vendors to follow, instead of concentrating on how to woo Windows vendors with announcements like DAX. As usual, IBM couldn't even follow its own party line:

- One OS/2 vendor who was exhibiting at the Technical Interchange was asked by the IBM PowerPC group to accelerate the porting of their OS/2 application to Windows NT.
- During the keynote speech and many other demonstrations, IBM used NetScape for Windows as the sample World-Wide Web browser, instead of the OS/2 WebExplorer or even the IBM Windows' Internet Access Kit's Windows-based browser.

No porting tool or distribution method can make customers buy into a strategy that IBM clearly has trouble believing in itself.

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OS/2 Warp Connect

In early May, in a flashy Manhattan ceremony, IBM announced the release of OS/2 Warp Connect, the "corporate" version of OS/2 Warp that was designed to launch it back into OS/2's traditional bread-and-butter realm. This new version of OS/2 includes drivers to connect to NetWare, TCP/IP, LAN Server, Windows for Workgroups, Windows NT, LANtastic, and the new OS/2 Peer LANs. The Bonus Pak adds IBM's remote access product—LAN Distance Remote 1.1, the Notes Express 3.3 client, the new Network SignOn Coordinator, and the AskPSP on-line troubleshooting kit.

OS/2 Warp Connect with Win-OS/2 (the blue-boxed Full Pack) has a suggested retail price of $299 with upgrades from OS/2 2.1x at $189. OS/2 Warp without Windows code (the red-boxed OS/2 Warp Connect for Windows) will be available on July 21 for $229. Upgrades from OS/2 Warp, with and without Win-OS/2, to the new version are $139. Of course, retail and mail-order prices for all versions of OS/2 Warp are significantly less than IBM's suggested pricing.

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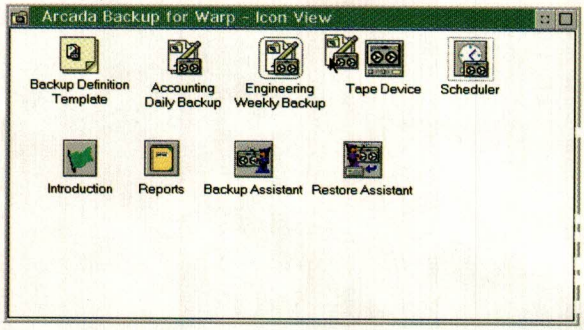
Just Announced

Late-Breaking Developments in the World of OS/2

Arcada Backup 1.0

All-around backup utility

Arcada Software is releasing Arcada Backup for OS/2 Warp. This Workplace Shell program supports HPFS files, uses error-correction codes, has a scheduler for unattended backups, and a file access for SCSI devices. Tape backup hardware support includes QIC-80, Parallel port, QIC 3010/3020, SCSI, ATAPI, and wide tape. Arcada Backup for OS/2 Warp has a retail price of $99 for the QIC version and $149 for the SCSI version. Despite its name, this product runs on OS/2 2.11 or higher. Contact Arcada at (800) 327-2232, (407) 333-7500, fax (407) 333-7770, or e-mail *sales@arcada.com*.



READER SERVICE NO. 151

WinRunner for OS/2

New testing tool

Mercury Interactive is releasing their GUI cross-platform testing tool for OS/2. WinRunner for OS/2 can create scripts to test PM applications and writes reports that document the results of tests. Scripts are created in WinRunner's object-oriented scripting language, SMARTest, which can be broken down and reused for other applications. WinRunner for OS/2 is priced at $4,950. Contact Mercury Interactive at (408) 523-9900 or fax (408) 523-9911.

READER SERVICE NO. 152

JAM for OS/2

Cross-platform development

JYACC is releasing their client/server graphical application development tool on the OS/2 platform. JAM for OS/2 currently includes database drivers for JYACC's prototyping database (JDB) and such relational databases as Oracle, Sybase, Informix, and DB2. The development environment is cross-platform, allowing applications that are developed on JAM for OS/2 to be run on more than 100 other platforms. The price of the OS/2 package is $2,000. Contact JYACC at (212) 267-7722 or fax (212) 608-6753.

READER SERVICE NO. 153

Backpack 4x CD-ROM

Parallel-port CD-ROM

Micro Solutions Inc. is shipping a plug-and-play parallel-port quad-speed CD-ROM player. This caddyless player will work through any parallel port, but has software drivers that take advantage of both enhanced parallel ports (EPP) and IEEE 1284 ports. An optional 16-bit sound card allows sounds to be played in conjunction with and independent of the CD-ROM drive. The sound card is capable of playing 16-bit sounds and has 20-voice FM synthesis, four FM operators and 128 MIDI instruments. The Backpack 4x CD-ROM sells for $659. Contact Micro Solutions at (800) 890-7227, (815) 756-3411, or fax (815) 756-2928.

READER SERVICE NO. 154

VX-Calendar

New VX-REXX add-in

DB Technologies Inc. is releasing a calendar object for VX-REXX. The VX-Calendar provides developers with an easy-to-use intuitive means of viewing date information. Dates can be moved between the calendar and other objects with drag-and-drop operations. It also includes support for different fonts, leap years, date navigation through properties and methods, and selection of individual dates. The VX-Calendar object was written in C, is SOM-based, and is available from the VX-REXX toolbar. The package includes royalty-free distribution and is priced at $99. Call DB Technologies at (813) 378-3760 or fax (813) 377-7392.

READER SERVICE NO. 155

Microsafe Access Control for OS/2

Access protection from Boot up

M&T Technologies is releasing a software data-protection device for OS/2. Microsafe Access Control password-protects hard drives, requiring a password before the operating system will load. The machine can still be booted with a floppy disk, but the hard drive will be inaccessible. The OS/2 version of this utility will also protect dual-boot machines when they are booting from DOS. Microsafe Access Control for OS/2 retails for $39.93. Contact M&T Technologies at (602) 994-5131, fax (602) 994-1336, or e-mail *msafe@indirect.com*.

READER SERVICE NO. 156

Late-Breaking Developments in the World of OS/2

Just Announced

GammaTech IRC 1.0

Internet relay chat

SofTouch Systems released a Presentation Manager-based client for the Internet Relay Chat (IRC) protocol. IRC allows users to type notes in real-time across the Internet on channels that are generally dedicated to different topics. The GammaTech client has a customizable toolbar, which is capable of issuing IRC commands and changing conversation channels. GammaTech IRC has a suggested retail price of $49.95. However, an introductory price of $39.95 is currently available. Contact SofTouch at (405) 947-8080 or fax (405) 632-6537.

READER SERVICE NO. 157

Preditor/2 2.1

Update to editor

CompuWare announced an update to their Presentation Manager editor, Preditor/2. Version 2.1 includes a detached window mode that allows all of the tools to be used as parts without the base window. Other new features include color syntax highlighting, better hypertext-browsing tools for C/C++, and various performance enhancements. Preditor/2 2.1 is priced at $149 and has an upgrade price of $69. Contact CompuWare at (800) 535-8707, (810) 737-7300, fax (810) 737-7108, e-mail *preditor@compuware.com*.

READER SERVICE NO. 158

Golden CommPass 2.2

Update to CIS off-line navigator

Creative Systems Programming is announcing an update to their OS/2 off-line reader. Golden CommPass 2.2 offers improved support for OS/2 Warp and interfaces to more areas of CompuServe, such as ZiffNet, stock quotes, and Electronic News Service. Golden CommPass 2.2 retails for $99. Anyone who owns an earlier version of Golden CommPass can upgrade for $49. Contact Creative Systems at (609) 234-1500, fax (609) 234-1920, or e-mail *71511.151@compuserve.com*.

READER SERVICE NO. 159

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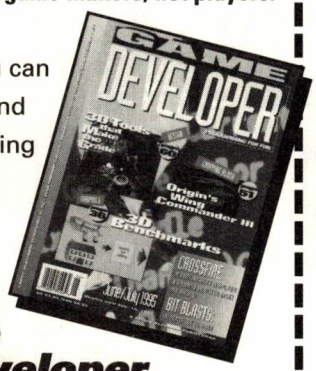

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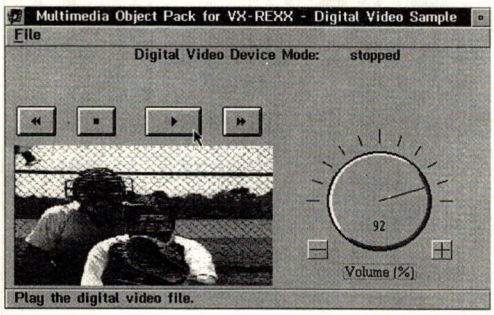

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Reader Service No. 8

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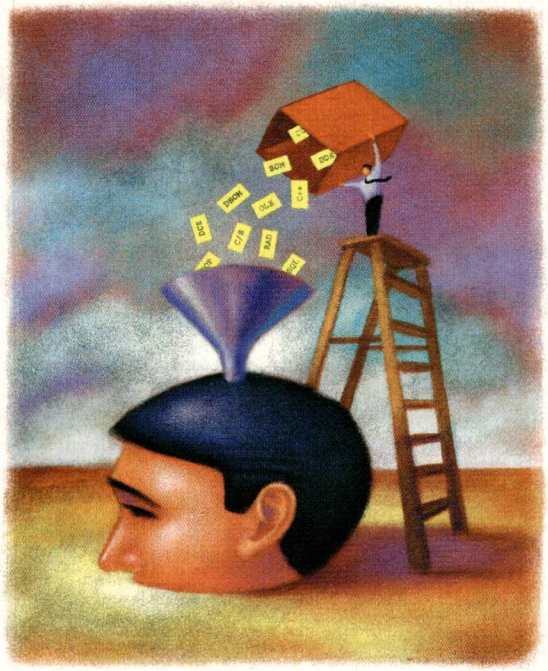

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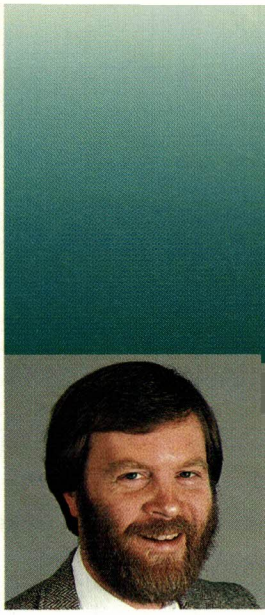

Freedom of Choice

IBM SHOULDN'T ATTEMPT TO FORCE ANYONE TO SUPPORT OS/2.

BY WILLIAM F. ZACHMANN

My June 1995 column (p. 15) stirred up an unusual amount of controversy. Quite a few self-proclaimed OS/2 enthusiasts complained not only that OS/2 should never support Win32 applications, but that it should not have supported 16-bit Windows applications in the first place. Windows support, they argued, undermines OS/2. As long as Windows applications run well on OS/2 Warp, software vendors won't bother to develop native OS/2 applications.

A similar cry is often heard from these "OS/2 enthusiasts" about the IBM PC Company pre-loading Microsoft operating systems on computers and the glacial pace at which IBM PCC has moved to pre-load OS/2 Warp. They responded with reactions that range from anger to despair when, in early May, IBM PCC announced support for Windows 95 on its systems.

IBM would have to drop support for anything but OS/2 Warp in IBM PCs, preload only OS/2 Warp, and halt support for Windows applications on OS/2 Warp just to satisfy these OS/2 zealots. They would argue that the only way to increase native OS/2 applications, thereby ensuring OS/2 Warp's success, is to force IBM PC buyers to use OS/2 Warp and to force software developers to create OS/2 versions of their applications.

Such policy, however, both over and under-estimates OS/2 Warp in precisely the wrong ways. Advocates of such measures overestimate the ability of such a strategy to work if launched before conditions are right and underestimate OS/2 Warp's capability to attract first-class application development.

The notion that independent software vendors (ISVs) will be motivated to create native OS/2 versions of their applications by such tactics is viable if (and only if) ISVs believe that they will miss a profitable opportunity by failing to do so. Until that happens, demanding such an either/or choice would simply ensure that OS/2 would gain almost no new applications.

Even with approximately seven or eight million copies of OS/2 in active use, very few ISVs make much money selling native OS/2 applications. Interest in OS/2 applications is finally picking up among ISVs, but the majority of established software vendors are not yet convinced that they will miss big opportunities.

The last thing OS/2 needs (or has needed) is for IBM to make an "our way or the highway" demand of software vendors. If IBM had left support for 16-bit Windows applications out of OS/2 2.0 and 2.1, OS/2 would probably be as dead today as its critics and enemies wrongly claimed it was. To make such a demand of ISVs, even today, would still do OS/2 more harm than good. It will only make sense when OS/2's installed base is big enough to create a clearly profitable opportunity for OS/2 applications. OS/2 isn't at that point yet and probably won't be until OS/2 Warp's active installed base hits approximately 15 to 18 million users, worldwide. That number is my current guess, but we'll know what the exact point is by one very simple criterion: some of the pioneer OS/2 application vendors will start to make some serious money as their OS/2 applications hit the bestseller charts.

OS/2 will not reach those levels (nor would it have reached its present level) without its support not only for 16-bit DOS but for 16-bit Windows applications. It will not reach those levels by ignoring Win32 applications. That does not necessarily imply complete run-time support for Win32 applications; however, at least some attention should be paid to users' concerns about IBM stonewalling where Win32 is concerned.

In fact, IBM has not made any promises about full support for Win32 applications. They have not ruled out the possibility (and should not), but have made no explicit commitments either. They have taken a middle-ground approach to provide partial support for some Win32 API calls to make it easier for Win32 application developers to port applications to OS/2. That approach involves partial support for the Win32 API on OS/2 Warp, but the end result, if the strategy succeeds, will be native OS/2 applications.

If that strategy works and OS/2 Warp continues to gain market share, which it has been doing very successfully for some time now, a very good chance exists that IBM will never need to provide complete Win32 support on OS/2 Warp. Both OS/2 Warp's installed base and the selection of native applications will finally gain critical mass so that IBM can successfully require the "our way or the highway" choice of ISVs.

People who insist that IBM demand such a choice immediately also under-

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estimate OS/2 Warp's ability to attract native software and provide a superior platform once that critical mass is reached. In fact, despite the fact that ISVs have not done very well financially with native OS/2 applications so far, a large and growing selection of very good native applications for OS/2 Warp already exists, and more come along every month. The train has finally left the station and is picking up a good head of steam.

If OS/2 Warp is actually the superior product its more zealous supporters believe it is, IBM won't need to force ISVs to write native applications for it. Once its installed base is big enough to offer a healthy market, they will write them willingly. Neither will the IBM PC Company need to force customers to accept OS/2 Warp only when they buy personal computers from IBM. PCC certainly dragged its feet with OS/2 Warp preloads and I have criticized them in the past for it and IBM management for allowing them to do so. But now that they are finally offering OS/2 Warp preloaded, I can see no reason to demand that they refuse to provide or support Windows 95, if that is what a customer prefers.

No matter how much they may think of themselves as supporters of OS/2 Warp, anyone who insists that the only way to native applications is to cram OS/2 down customers' throats, whether they want it or not, is just as much a detractor as those who oppose it. At the very least, they demonstrate a lack of faith that OS/2 is a superior product and that ordinary people will make sensible choices. If OS/2 Warp must be forced upon people to succeed, it does not deserve success and won't attain it. In fact, OS/2 Warp needs nothing of the sort to succeed. Accurate information and freedom of choice for ISVs and for users will be more than enough to make OS/2 Warp a very successful product.

Will Zachmann, a well-known computer-industry analyst, is the founder and president of Canopus Research, based in Duxbury, Mass. He is also a former senior vice-president for corporate research of International Data Corp. You can reach him on CompuServe at 76004,3657, or on his popular CANOPUS forum.

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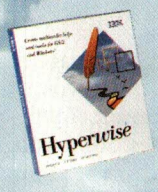

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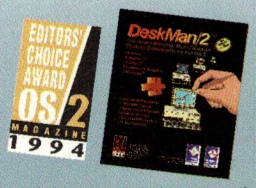

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Compression Protection

ZIPSTREAM 1.03C AND DR. SOLOMON'S ANTI-VIRUS TOOLKIT VERSION 7.00.

BY BRIAN PROFFIT

ZipStream 1.03c

As my colorful Appalachian great-grandmother once put it: "If you try to stuff 10 pounds of manure into a five-pound bag, you're going to have a mess on your hands." Substitute the word data for manure and disk for bag and you see the broad truth of her observation.

As long as computers have been around, people have been using a variety of schemes to squeeze every last penny out of their storage dollar and stuff more data onto their existing storage medium. Unfortunately, most of these schemes come with significant trade-offs in performance, simplicity, or data integrity. ZipStream offers the best balance of these trade-offs that I've seen and manages to compress files into half the space (or less).

Works within OS/2's structure

Part of the beauty of ZipStream is that it works with the existing OS/2 file system interfaces and structures. You don't have to reformat partitions into some new structure to make it work. It doesn't utilize convoluted new file access techniques to stuff data into a "container" file (which is really just an analog of a new partition). The integrity of data is of paramount concern, and using the standard interfaces provides a level of protection over schemes that would access the disk directly. Using OS/2's interfaces also guarantees that ZipStream has no problem with long file names or extended attributes.

Part of the beauty of ZipStream is that it works with the existing OS/2 file system interfaces and structures.

On the other hand, you cannot compress OS/2 device drivers because they are loaded before the file systems are initialized. In fact, the new ZipStream drive letter won't even exist at that point. That's not a big deal, though, as the device drivers are probably an extremely small percentage of your total disk space.

ZipStream works by assigning an additional drive letter to each partition that will contain compressed files. Note that the entire partition isn't compressed. The decision is made on a file-by-file basis, and it is typical for a partition to have both compressed and uncompressed files. You can access the uncompressed files with the drive letter that OS/2 assigned to that partition while the compressed files are accessed with the new drive letter that you assign when you attach that drive to ZipStream. Actually, you can use the new drive letter for all access, as ZipStream can detect whether the file was compressed or not and decompress or pass the file on as it is. I'd recommend that you get in the habit of using the new file letter for all access.

This practice leads, though, to the biggest annoyance that accompanies ZipStream. You might be surprised at the number of *.ini* files that contain path information—and not just the OS/2 *.ini* files. Many applications have their own configuration files. All of the programs that are installed before you start using ZipStream are expecting the old drive letter, and you will probably spend a fair amount of time cleaning up those references. Some programs, such as FaxWorks, can't be compressed after installation and will have to be reinstalled using the compressed drive letter. Still, you can get this chore out of the way when you first start using ZipStream and you don't need to worry about it again.

As you copy existing files to the new drive letter or create new ones there, the files are automatically compressed. You can also compress existing files with the **zspack** command, or by dragging and dropping onto the ZSPack icon. Note that floppy disks can also be compressed, as those drives can be attached just like fixed disks. Even better, it also works with network file systems. And, because the decompression takes place at the workstation level, this ability decreases the amount of data that has to move across the net and doesn't add to the server overhead. If you press your own CD-ROMs, you can even compress the files on them. However, the person who reads the files must own ZipStream to decode them.

Native OS/2 power

ZipStream is a native 32-bit OS/2 application—not a port or migration. In fact, ZipStream is OS/2-only at the moment, although a DOS version is expected by the end of 1995 to help people who are using dual-boot systems. The beauty of it being a native OS/2 application comes shining through when you copy a large number of files to the compressed path. Instead of slowing the system down and forcing you to wait until the copy/compression is complete to access those files, ZipStream handles the compression transparently in the background using a separate thread. When you access the files from the compressed path, ZipStream's routines determine whether a file is compressed or not and lets you read the file normally, regardless of its compression state.

During one particularly long copy operation (while I was doing a background file download and printing a document), I did see a performance hit for a couple of seconds. If your system is so busy that ZipStream falls behind by a certain amount, it temporarily boosts its priority to avoid getting further behind. The lag I experienced was brief, understandable, and not something that occurred during my normal processing.

Note that all of this puts additional pressure on you to be disciplined in your use of OS/2. It is always a dangerous mistake to turn your computer off without going through a proper OS/2 shutdown. It is even more important when running ZipStream, as compression/decompression operations may be running in the background even though you thought your programs were finished. Running shutdown will ensure that all file activity is complete. If your system seems to hang and you can't shutdown, you should still try to reboot with <Ctrl+Alt +Delete> instead of turning the computer off. OS/2 detects this operation and sends an instruction to all running programs that they should shut down. While ZipStream won't be able to complete any operations it is currently running, it will at least close all open files in an orderly manner.

ZipStream, as an OS/2 application, is aware of and exploits the disk cache routines that are already used by OS/2. It also has several other internal caches, the most important of which is the Virtual File Cache (VFC) that is used to hold decompressed files. When a file is opened, ZipStream uses background threads to read ahead into the file and begin decompressing the data—even before the program has requested the data. Because of ZipStream's additional caching, it is even more important that you have a good amount of physical memory to avoid excessive paging.

ZipStream also applies some intelligence to its compression, using different techniques based on file size and type. It detects OS/2 system files and leaves them uncompressed. It also detects files that have already been compressed through some other means (such as PKZIP) and leaves them untouched.

ZipStream uses another interesting method to improve performance: It sometimes does not use the cache! If ZipStream has a file that is uncompressed in its cache, but is writing the compressed version to disk, it bypasses its cache, so the uncompressed data remains undisturbed and ready to be used by your programs.

You can also add some intelligence of your own. By specifying a Warp option when you pack a file, you can strike a balance between file access performance and memory requirements by adjusting the length of time that the specified file will spend in the Virtual File Cache.

All of this effort does require some system resources. I wouldn't recommend that you try ZipStream on systems smaller than a 12MB 486. Like most OS/2 applications, the more memory, the better ZipStream performs. I found it difficult to detect an effect on performance on a 25 MHz 20MB 486 and a 90MHz 16MB Pentium.

With version 1.03, ZipStream no longer inserts itself into your *\os2* and *\os2\dll* directories, and I vigorously applaud Carbon Based Software for this change. I wish all vendors would stay out of my OS/2 directories. I also commend the developers for including a de-installation program.

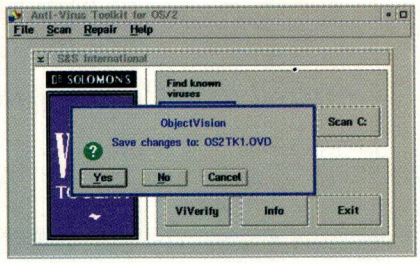
On the other hand, ZipStream insists on installing itself in the OS/2 boot partition. Even though I changed to a different drive letter, when prompted during installation, ZipStream ignored the change and went to the OS/2 drive. Carbon Based Software reported that it was a safety feature, as they can't be certain that the other drive uses the same file system as the boot drive, and OS/2 doesn't guarantee that the other file system would initialize before ZipStream.

Glee or flee

I always recommend using a large hard disk over using a compression-on-the-fly program. It's safer that way. On the other hand, I do use ZIP and UNZIP to save space with files that I don't use frequently. ZipStream seems to be the perfect compromise. Because compression is done on a file level instead of the entire partition, you can always get to the files through native OS/2. And, if you have system problems, you can boot OS/2 from the installation disks and unpack files with the ZipStream disk. The only difficulty is for people who are using dual boot. They won't be able to read their compressed files from DOS until that version of ZipStream becomes available in late 1995.

ZipStream may not provide the absolute best compression or performance, but it's close. It does provide greater ease, simplicity, and safety than many competitors.

Dr. Solomon's Anti-Virus Toolkit 7.00



With the Internet Access Kit now included in OS/2 Warp, thousands more OS/2 users will be accessing programs from outside sources of unknown reliability. In other words, this blessing brings with it the downside of many new opportunities for viral infection of OS/2 systems. S&S International brings OS/2 users another way to fight this problem with Dr. Solomon's Anti-Virus Toolkit.

Mind you, it's still true that no OS/2 viruses are known to exist "in the wild," although S&S claims to have one in its lab. It is also true that OS/2 users have some protection from DOS viruses, because many viruses work through undocumented gateways into DOS that

don't exist in OS/2's DOS simulator. Still, OS/2 users are susceptible to many DOS viruses and it pays to be careful. Besides, you have a multitasking operating system that lets virus detection programs run in the background while you continue with other things.

Covering the basics

A good virus-detection package needs three key features. It must have a scanning program that can read through the files on your disk and examine them for known viruses. It must have a monitoring program that stays in memory and detects and stops a virus before it has a chance to work. Finally, it must be able to remove the virus and (where possible) repair the damage. Dr. Solomon's covers each base, at least hypothetically.

As with most other packages, Dr. Solomon's uses two different methods to scan files for viruses. The first method is simply to read through the file and calculate a checksum based on the file's contents. Checksums are an often-complicated technique that uses each character in a file to create a single number to represent the file's contents. If any part of the file changes, even slightly, the FindVirus program should generate a very different checksum. This technique is normally used only on executable programs, because they rarely change. A different checksum causes a warning that a virus may have modified the program. (Whenever you upgrade one of your applications, be prepared to receive these warnings as the new version will have a different checksum.)

The second scanning method uses signatures (short sequences of characters that are known to occur within viruses). If the signature of a virus is detected, it is possible that you have been infected. Of course, the signature could also accidentally, innocently, and harmlessly appear in a perfectly good program. The best virus detection packages can also detect these cases and avoid worrying the user with false positive warnings. Dr. Solomon's ViVerify program generated no false positive messages in scans of nearly 2,000 files (including files for which Central Point Anti-Virus generated a false positive).

If you manually enter the correct command-line switches, FindVirus will also scan within files that were compressed with LZExe, PKLite, PKZIP, and ARJ utilities. You should note, though, that unlike its competitors from IBM and Central Point, Dr. Solomon's split the two methods into separate FindVirus and ViVerify programs that you must manually start on an individual basis to get both types of detection. Both are OS/2 programs that run happily in the background and work on FAT or HPFS partitions.

The memory-resident monitoring component of Dr. Solomon's, called VirusGuard, is a DOS program, which makes sense because all of the viruses that it monitors for are DOS-based. Unfortunately, VirusGuard is installed in yet a third step. After installing the OS/2 software, you have to install the DOS programs in a DOS session and then install VirusGuard. But the installation program kept crashing on me before it installed VirusGuard (or several other things on the second DOS disk).

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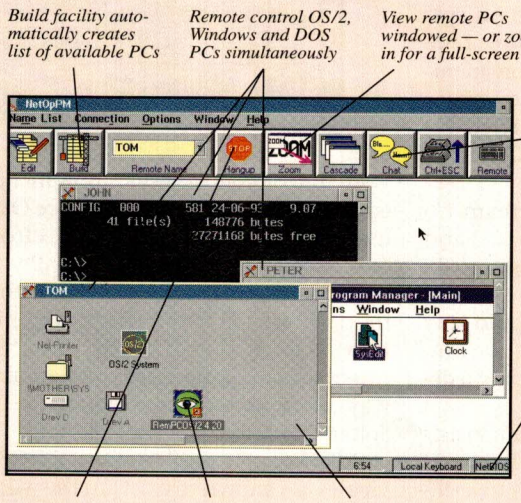
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Be warned that technical support is patchy. I asked several questions that were never answered and was promised phone calls that never came. I was never able to get VirusGuard installed and I had trouble with the other DOS programs as well. For example, the Disk Inspector kept insisting that every one of my disks and fixed disks started with an invalid sector and completely refused to allow inspection of hard disks whether I ran it from FAT or HPFS.

The virus removal component of Dr. Solomon's AV Toolkit seemed to work well, although I was obviously unable to test it against all possible infestations. Also included in the package is a Virus Encyclopedia, a database of known viruses, their effects, and whether they can be repaired using Dr. Solomon's Toolkit. The on-line version is a bit sparse and difficult to negotiate, but the 250-page printed version includes much more information.

User-interface quirks

Automation and simplicity are not the strongest points of this package. For example, while file scanning is something that you might want to do automatically during the boot process, you aren't given the option of updating the *startup.cmd* file during installation. Instead, the book instructs the user to modify *startup.cmd* manually.

Dr. Solomon's Toolkit has a graphical front-end but is composed of command-line programs, and a command session is opened when you run them. That approach isn't necessarily bad, though, because it means that they can be run from the OS/2 boot disks if you're suspicious of your system. On the other hand, the graphical front-end is quite minimal and has nowhere near the ease and convenience of the Windows version. For example, in dialog boxes where you set the parameters for the program, you have to manually type in the same command-line switches that you would have used at a command prompt.

By the way, those switches aren't described in the OS/2 documentation. You have to go to the Windows & DOS manual to find them. In fact, barely a dozen pages describe the OS/2 version. That's because so much of the functionality isn't available to people who run only OS/2. You need to install the included DOS version and run it to get to some of the additional features, such as the VirusGuard and GuardMem memory-resident utilities. Even then, the manual taunts you with even more features that are available only in the Windows version. I realize that it is rather common for vendors to have more features in Windows versions of their products. However, I don't think it is necessary to rub OS/2 users' noses in that fact by making them use the Windows manual that shows lots of things they can't do.

Some of the included functionality is not even very easy to access. An entry in the DOS toolkit menu (which isn't even available from the OS/2 toolkit menu—you have to go back and forth between the two versions) is labeled Schedule. Ostensibly, this entry allows you to prompt some of the detection programs to run automatically. But clicking on this entry

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simply reveals a message telling you to read the manual for instructions on running the DEFERBAT and DEFERKEY programs from the command prompt!

Glee or flee

Dr. Solomon's is not a bad anti-virus product, and if it was the only entry in the market, I'd probably recommend it, warts and all. It is very thorough and accurate in virus detection, specifically scanning for more than 5,800 viruses and aggressively eliminating false positives. I am, however, concerned about the inability to run the memory-resident program and the fact that S&S Software has failed to provide technical support to help me resolve the problem. With these concerns in mind, IBM's AntiVirus/2 (which is also priced more attractively) still gets the nod.

Brian Proffit has been in the computing industry for 20 years. He was part of IBM's OS/2 team, left IBM to become the director of PC Week's Corporate Labs, and is now the president of Visionary Research. Brian is the author of three books on OS/2, is a contributing editor for OS/2 Developer, and senior contributing editor for OS/2 Magazine. He can be reached at Internet 75300 .1466@compuserve.com.

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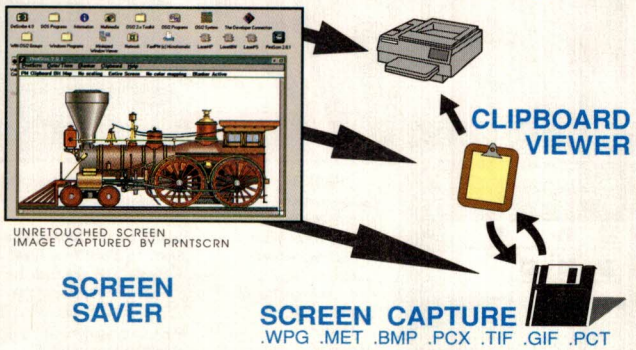

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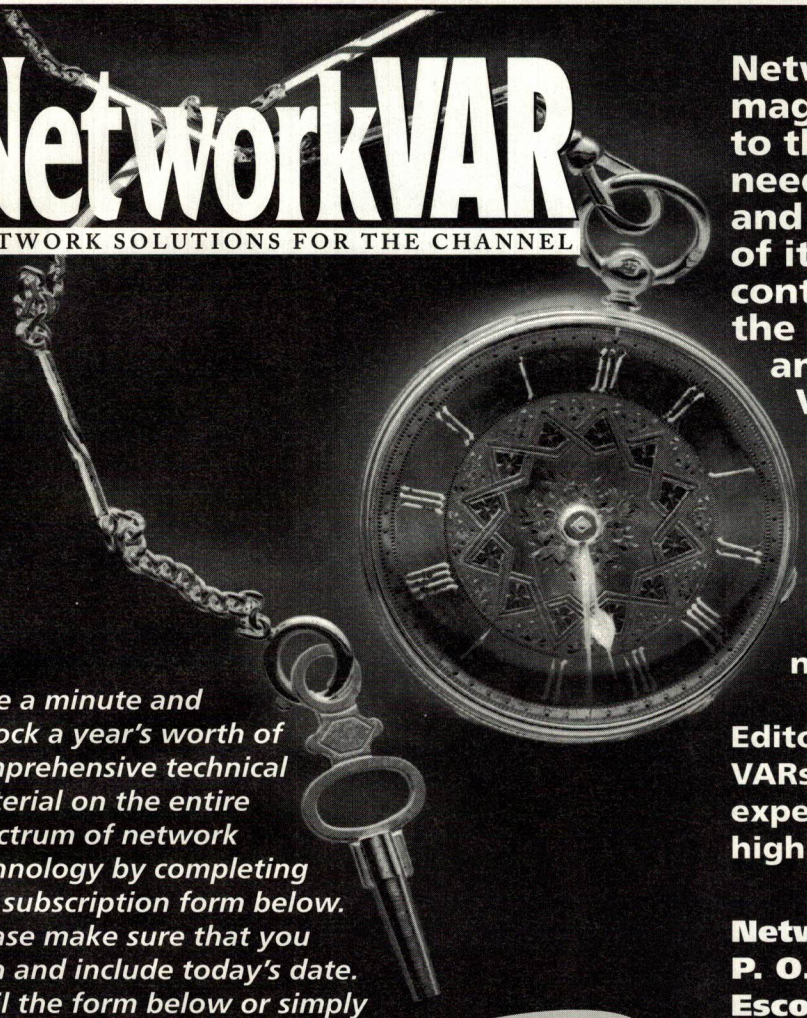

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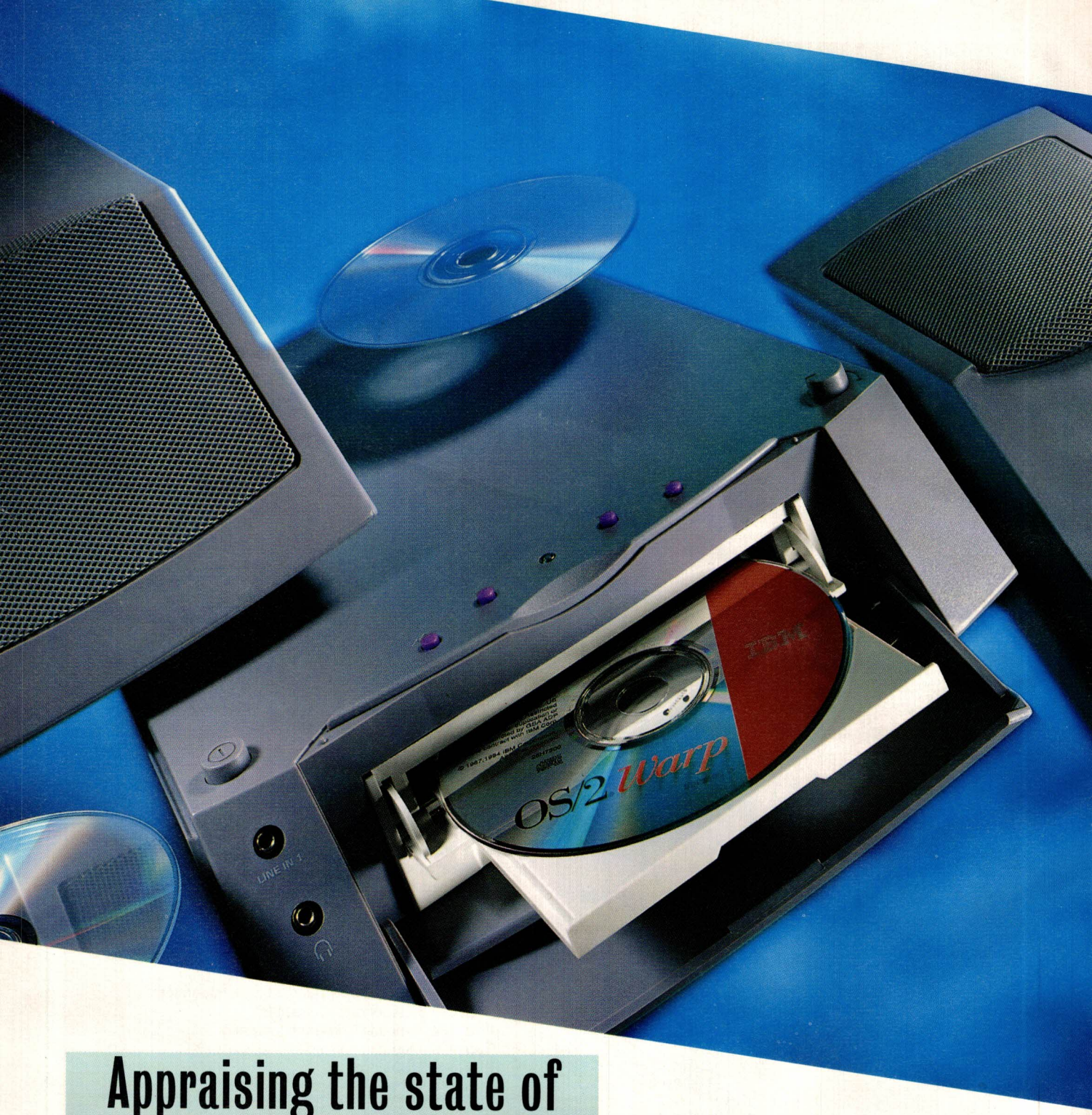

Appraising the state of multimedia and OS/2, past, present, and future.

BY GUY WRIGHT

OS/2 Multimedia:

A well-kept secret

With the release of OS/2 Warp 3.0 and the accompanying media blitz touting OS/2's ease of use, Internet capabilities, and amazing multimedia, one would think that there are hundreds of products out there ready to fill our lives with video, animation, and music. From a programming standpoint, OS/2 looks like the ideal multimedia environment, with a slick AVI video format, multitasking, sound support, and all the other bells and whistles. However, the truth is that multimedia software and hardware for OS/2 just isn't here yet.

It would be nice to be able to list dozens of OS/2 multimedia products and point out some of the better ones. It would be nice to say that all sorts of tools are available for multimedia developers. It would be nice to say that OS/2 is state of the art, that it's the multimedia platform of choice, that it is stealing the show. Unfortunately, you can list the number of multimedia titles on one hand (with fingers to spare), the development tools are sparse or nearly non-existent, it is far from the platform of choice, and to be brutally honest, OS/2 isn't even in the show—yet.

So what's the problem? Is it IBM? The developers? OS/2 itself? The answer is: All of the above. Is multimedia on OS/2 dead in the water? Not quite—but it's going to be a while before it is swimming strong.

Tools

Ever since the first release of OS/2, IBM has been trying to encourage developers to create new products or port existing products to OS/2. They realized that, to make the job easier for developers, they had to create tools. The first tools were compilers, libraries, utilities, and eventually languages for programmers. Since IBM is essentially a business-oriented company, most of the early tools were geared toward developing and porting traditional business applications. To this end, they have been fairly successful. OS/2 is one of the most robust networking and database environments anywhere.

Of course, business is one of the last places you are likely to find multimedia. Businesses aren't interested in state-of-the-art anything unless it shows measurable results on the bottom line. Who needs a talking spreadsheet? Video and animations are just going to slow down the network, and sounds are mere distractions in the workplace. In fact, I'm sure that IBM sales people occasionally met with some resistance to the whole idea of a graphical user interface, icons, and even mice. Just look at the number of OS/2 products that are still command-line, text-oriented applications that don't even try to make use of the workplace environment, or the IS utilities that are designed specifically to keep those pesky users from customizing anything on their system. Needless to say, these early tools weren't much help for multimedia developers.

One could argue that a good compiler is a critical multimedia tool and, while that is certainly true, would you like to write your own paint, image-processing, rendering, animation, sound, music, and video digitizing and editing programs to enable you to create your graphics, sounds, and animations and then write the routines to display and play them so that you can write your game program? Of course not.

As the years went by, IBM eventually got around to all the secondary and tertiary applications and tried to determine what their needs might be. Among these poor step-children was multimedia as an entire category. While the folks at IBM realized that OS/2 could be a great multimedia platform, it appears that they never really understood what multimedia was from the very beginning. Let's face it, IBM has had the same mindset that most businesses have toward multimedia: How is it going to add to the bottom line?

Unfortunately, OS/2 is in one of those old chicken-and-egg situations. OS/2 appeals to business users. Business users don't buy multimedia products, so multimedia developers put OS/2 near the bottom of the list. Since there aren't many multimedia developers clamoring for OS/2 multimedia tools, the developers of those tools also shy away from OS/2, and IBM doesn't see the need to encourage the multimedia

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tool developers. No tools, no market, no multimedia applications. And without multimedia applications, the only people that are interested in OS/2 are businesses.

IBM has tried to correct its lack of multimedia tools to some degree and, according to Lloyd Webber, world-wide games and home entertainment manager for IBM, and Ed Anderson, OS/2 technical planner, they have added a lot of new multimedia bells and whistles with the release of OS/2 Warp and are working on others. OS/2 Warp includes a much longer list of device drivers, particularly for SVGA boards and CD-ROMs. The installation routines are not only easier for the average user, they are much better at determining what hardware is attached to the system. Also, with OS/2 Warp, OS/2 supports Video-CD, MPEG, CD+, DIVE, and Kodak's PhotoCD.

Since version 2.1, OS/2 has had the facilities for writing directly to the screen using Direct Interface Video Extensions (DIVE). Currently, work is being done on an extension of this technology called enDIVE (enhanced DIVE), which will add video hardware acceleration to this API.

OS/2 APPEALS TO BUSINESS USERS. BUSINESS USERS DON'T BUY MULTIMEDIA PRODUCTS, SO MULTIMEDIA DEVELOPERS PUT OS/2 NEAR THE BOTTOM OF THE LIST.

IBM has said that they are working on a MIDI subsystem for OS/2 that will allow MIDI programs such as Cakewalk to be ported to OS/2. Also in the works is a high speed timer for OS/2 that will provide the synchronization necessary for sound and high-speed graphics.

These and other developments will more than likely first appear in IBM's Game Developer's toolkit, a new version of the Developer Connection CD-ROM. (For more information on what else IBM is doing on the OS/2 multimedia front, check out the Developer News section of the OS/2 games homepage at *http:// www.austin.ibm .com/os2games/devnews/devnews.html.*)

Compilers and languages

In the tools category, other improvements have been made. Starting with compilers and programming languages, IBM's C Set++, which has just been through a new revision, has always been a strong and well-regarded product. Watcom, and MetaWare are also offering C/C++ compilers and, while not necessarily well suited to multimedia, APL2, FORTRAN#77, COBOL compilers, and COBOL cross-compilers are now available. The language that might have great potential for multimedia developers is Smalltalk. Visual Age from IBM, and the highly regarded Smalltalk/V from Digitalk are both capable of filling multimedia developer's needs and, although

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While not SPECIFICALLY DESIGNED TO BE MULTIMEDIA AUTHORING LANGUAGES, A NUMBER OF PROGRAMMING TOOLS AND PRODUCTS ARE AVAILABLE FOR OS/2

Smalltalk isn't traditionally considered a multimedia development language, these products do support many of OS/2's built-in features. To compliment these tools, a wide variety of utilities, debuggers, editors, linkers, and a growing number of object libraries are now available.

While not specifically designed to be multimedia authoring languages, a number of programming tools and products are available for OS/2, including Computer Associate's CA-Realizer, HockWare's visual VisPro REXX and C++ tools, GpfREXX from Gpf Systems Inc., and Watcom's VX/REXX.

Authoring languages

The next branch up the programming tree are the higher-level languages and authoring systems. These systems are usually designed to be easier to use and supply a number of pre-programmed functions such as graphics display routines, sound, animation, and even video. As with other programmer's tools in OS/2, many of the early systems were geared toward business application development, but some of them could be used for multimedia development. The most visible of the multimedia authoring systems would have to be IBM's Ultimedia series, which includes Builder/2, Perfect Image/2, Workplace/2, and Video IN. The Ultimedia products were among the first to directly address some of the needs of multimedia developers. However, they did not meet all the requirements and remain somewhat limited in their capabilities. Designed primarily for business presentations and end users, the Ultimedia tools have been largely ignored, both by the developer community and even IBM itself (no updates have been made to the series in almost two years.)

But IBM is not the only company in the multimedia authoring field. MultiMaster from Commix SP and IconAuthor from AIMtech have been available for a while now, and both products are highly capable of producing slick multimedia applications. Again, these products were designed primarily for in-house and end-user development of presentations or database front-end design rather than for commercial applications, but developers should not overlook their ease of use and powerful features. Network Technology has an OS/2 multimedia authoring system called MEDIAscript OS/2 and, while we have not had a chance to test the product, based upon the company literature, it should be a very powerful product capable of supporting a wide range of video and animation formats.

On the horizon, Macromedia has announced that they are working on a port of their famous Director authoring package for OS/2. Director and its associated multimedia products are considered to be the most powerful development tools available for the Macintosh and Windows platforms. Many games and multimedia applications, including the award-winning game Myst, were developed with Macromedia products. Macromedia plans to release an OS/2 port of their Director player utility first and hopefully the full set of products will follow shortly.

Kaleida Labs is in the process of rolling out the whole Kaleida platform for OS/2, which includes their media player and ScriptX language, class library, and application development and authoring tools. The Kaleida products are appealing because of their cross-platform nature. A script produced on one platform should play back flawlessly on any other platform that has a supported player. This compatibility would mean that multimedia developers would not have to develop different versions of the same program for each platform.

Images, animations, sounds, and video

Even if you have the most amazing authoring system in the world, you still have to put something on the screen and, in the case of multimedia, through the speakers as well. It doesn't do much good if you have a picture viewer with no pictures, sound player with no sound, or the best video playback system with no video. This has been one of the most frustrating areas for OS/2 multimedia developers. Until recently, if you wanted to create images, sound, and video for an OS/2 application you had to have a Macintosh or Indigo, or rely exclusively on Windows and DOS products. You then had to convert the results to OS/2-compatible formats. While this problem is not unique to OS/2, it has been yet another obstacle to overcome.

CorelDRAW from Corel Systems is a powerful 32-bit graphics package that has been available on OS/2 for quite a while now but any multimedia developer will tell you that one graphic package is never enough. In the past year, a handful of companies have entered the graphics market with products ranging from simple image and paint programs, such as Impos/2 from Compart, to sophisticated image-processing solutions like Colorworks from SPG, one of the first truly professional-level graphic packages for OS/2.

As far as sound, animation, and video are concerned, the OS/2 offerings are sparse and when it comes to rendering, raytracing, and 3D animation, OS/2 products just don't exist. The few OS/2 products that offer support for these critical elements of multimedia do not offer nearly as many features as their Windows and Macintosh counterparts and, with sound or music, the tools are little more than toys. Two bright notes on the video side come from Sigma Designs, with the release of their Real Magic MPEG suite of cards for OS/2, both for playback and capture and DAVE from Brand X, a digital audio/video editor.

In a related area of multimedia-development tools, Elektroson has announced the release of Gear for OS/2. Gear is a CD-R premastering package that allows developers to premaster and control compact disc-recordable (CD-R) drives.

Drivers

One of the problems that has plagued OS/2 multimedia development in the past is the fact that it has taken IBM and

the hardware venders so long to develop device drivers for the kinds of products that multimedia depends upon: graphics boards, joysticks, CD-ROM drives, yokes, and especially sound boards. The sound board driver problem is doubly damaging since most CD-ROM drives sold today are connected to sound boards. Again, the chicken-and-egg problem arises. If I am a sound board manufacturer and most OS/2 users (businesses) don't have or even want sound boards in their systems, then why should I bother writing OS/2 drivers?

The operating system

On the surface, OS/2 looks like it would be ideal for multimedia. It has built-in sound and graphics support. MMPM/2 ships with every copy of OS/2, providing users with the ability to play AVI movies, music, sounds, even control their CD players with the proper connections. OS/2 also supports voice recognition, light pens, graphic tablets and other "cool" input devices. But the most appealing aspect of OS/2 for the multimedia developer is multitasking.

With true multitasking, you can be playing an animation on one thread, handling audio with another thread, checking for user input with a third, and still be loading data in the background getting ready for the next scene or transition. This ability is especially important with CD-ROM, where data throughput is severely limited. By loading information in the background while something else is being presented to the user, the application runs much faster than if you have to load, play, stop, load some more, and so on. With a separate task dedicated to user input, applications are much more responsive. Sound effects, music, and narration are all easier to control using separate threads, and everything is easier to alter at run-time.

Unfortunately, this multitasking has a price. You pay for it in system overhead, speed, and programming complexity. One of the misconceptions about multitasking is that, by breaking down a problem into separate tasks, you gain processing power. Take rendering, for example. The rendering process is very processor-intensive, but it also lends itself to segmentation. In other words, many steps in the rendering process can be done independently of the others. It is not that difficult to split the tasks between multiple processors and speed up the process considerably. But multitasking doesn't really help rendering in a stand-alone environment. If it takes two hours to render a scene on a PC using DOS, with no multitasking, splitting the problem into separate tasks is still going to take two hours. In fact, the same task will probably take more than two hours because the processor also has to keep track of the multitasking.

OS/2 is no exception to this rule and, in cases where speed is of the essence, such as arcade-style shoot-em-up games, the multitasking overhead can be too great a price to pay. The OS/2 operating system was designed to be fairly generic, with the ability to handle a wide variety of contingencies. This flexibility is what makes OS/2 such a great operating system, but if a programmer only needs to do one or two

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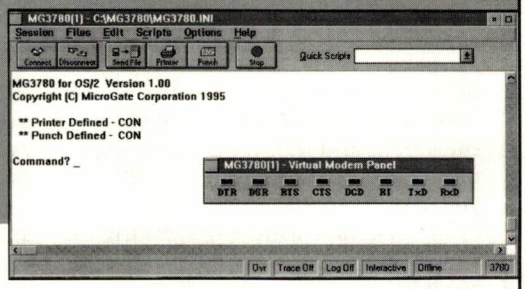
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specific things, the flexibility can become a burden. Compare the BASIC and Assembler programming languages. BASIC is much more programmer-friendly, handles many programming tasks for you, and has a great deal of flexibility. Unfortunately, because it has to handle so many possibilities, the routines are very generic and, therefore, slow. Assembly language programming is difficult, has very few "pre-programmed" routines, but, if written correctly, programs run faster than programs written in any other language.

OS/2 also imposes a lot of restrictions on programmers who wish to adhere to "proper" programming conventions. Well-behaved OS/2 programs are supposed to have things like notebooks, are supposed to coexist peacefully with any and all other OS/2 applications, are drag-and-drop enabled, and, in the future, should be object-oriented OpenDoc or Taligent compliant (just in case someone wants to embed a copy of Mutant Blaster in their spread sheet). All of these guidelines are appropriate in many cases but tend to bog down applications that need to squeeze out every clock cycle. Multimedia applications tend to use processor-intensive features such as sound, video, and animation.

While most traditional programmers would be appalled by the way most games are written, the truth is that complicated operating systems are more a hindrance than a help. Game programmers have a tendency to "write to the metal" to squeeze every iota of speed from the system. They violate rules right and left, they use undocumented calls, they tweak and fiddle, and in many cases, simply take over the entire system, trashing everything in the process. Games are usually not "well-behaved" programs. The reasoning is usually something like "I can't get the speed I need if I have to sit around waiting for the OS to allocate resources. If you are playing a game, then you aren't likely to be doing anything else at the same time," and "The game is only going to be on the shelves for a few months, so changes to the system that might break my undocumented calls aren't that important." So, if you're going to trash the system anyway, why fight it in the first place?

A few well-behaved games (see *OS/2 Magazine*, June, 1995. pp. 28-38) are now available now for OS/2 and more are in the works, but most of these offerings are not arcade-style fast-action products. (IBM has been talking about and showing OS/2 versions of Doom for a while now but the conversion has been a major undertaking and, at the time of this writing, the game has still not been released. Of course, at the same time, Microsoft has been discussing a Windows version of Doom nearly as long and they have had their own problems.)

Curiously enough, we have seen one remarkable multimedia application from a most unlikely origin. This product supports graphics, animation, real-time interaction, and even video. Onspec, from Onspec Automation Solutions, is a plant-floor monitoring and control-software system primarily designed for use in factories. Input is gathered from a wide variety of sensors, fed through a network, and displayed graphically. An operator can monitor machinery, progress on an assembly line, issue changes to the system, generate reports, trigger REXX scripts, and perform dozens of tasks. Onspec is a case where multimedia does add to the bottom line.

Solutions

With all the problems I've mentioned, it is clear that the folks at IBM have their work cut out for them. They have made substantial improvements in terms of device drivers and have indicated that they are furiously working on many more. The graphics tools available have also come a long way—especially in the past year—but developers still need rendering, animation, and 3D. More professional-level video capture and editing tools are still needed (although Sigma Designs seems to be on the right track). Authoring systems and programming tools are just about up to snuff and soon will be comparable to Macintosh and Windows offerings. IBM has made great strides in providing developers with utilities, documentation, and support. It's still not perfect, but at least they are trying. The areas that need the most improvement are sound and music. OS/2 products in these areas are woeful and someone needs to step in to fill the void.

Finally, IBM needs to educate multimedia developers. They need to get across the message that OS/2 offers some unique and powerful features, that it is a strong and growing market for the home as well as business, and that they understand the problems facing multimedia developers. The last element may be the hardest for IBM.

The future

And what about the future of multimedia on OS/2? My prediction is that progress will be slow. I don't expect to see a lot of games ported to OS/2 or developed specifically for OS/2. Those that do appear will not be arcade-style shoot-em-ups, simply because the operating system itself slows things down quite a bit. (OS/2 may be faster for many applications but not in this area—yet.) Eventually, when IBM gets around to supporting some of the more sophisticated 3D rendering, real-time graphic engines, and custom 3D chip sets that are coming along, we may see more products in this area, but they still have a lot of catching up to do. The last of the multimedia applications to appear on OS/2 platforms will probably be educational or "edutainment" titles. If home and office users are in the minority, then children using OS/2 are an even smaller market.

I expect that every month will see more sophisticated and diverse development tools, but to balance that effort, a market must exist. IBM has been making pretty good strides toward marketing OS/2 Warp to the masses, and every month that Microsoft delays the release of Windows 95 means more sales of OS/2. It is close enough now that developing OS/2-specific multimedia applications is starting to be an attractive option. That trend should continue.

I also expect to see more and more products like Onspec gradually sneaking into offices through the back door. We are still in the beginning phases of that quiet revolution. OS/2 has already fired the early salvos by bringing multitasking and a graphical user interface into the office, and I'm confident that every year multimedia and OS/2 will add a few more pennies to the bottom line.

Guy Wright is the Executive Editor of OS/2 Magazine, was the founding Editor of Amiga World, and is an experienced multimedia developer.

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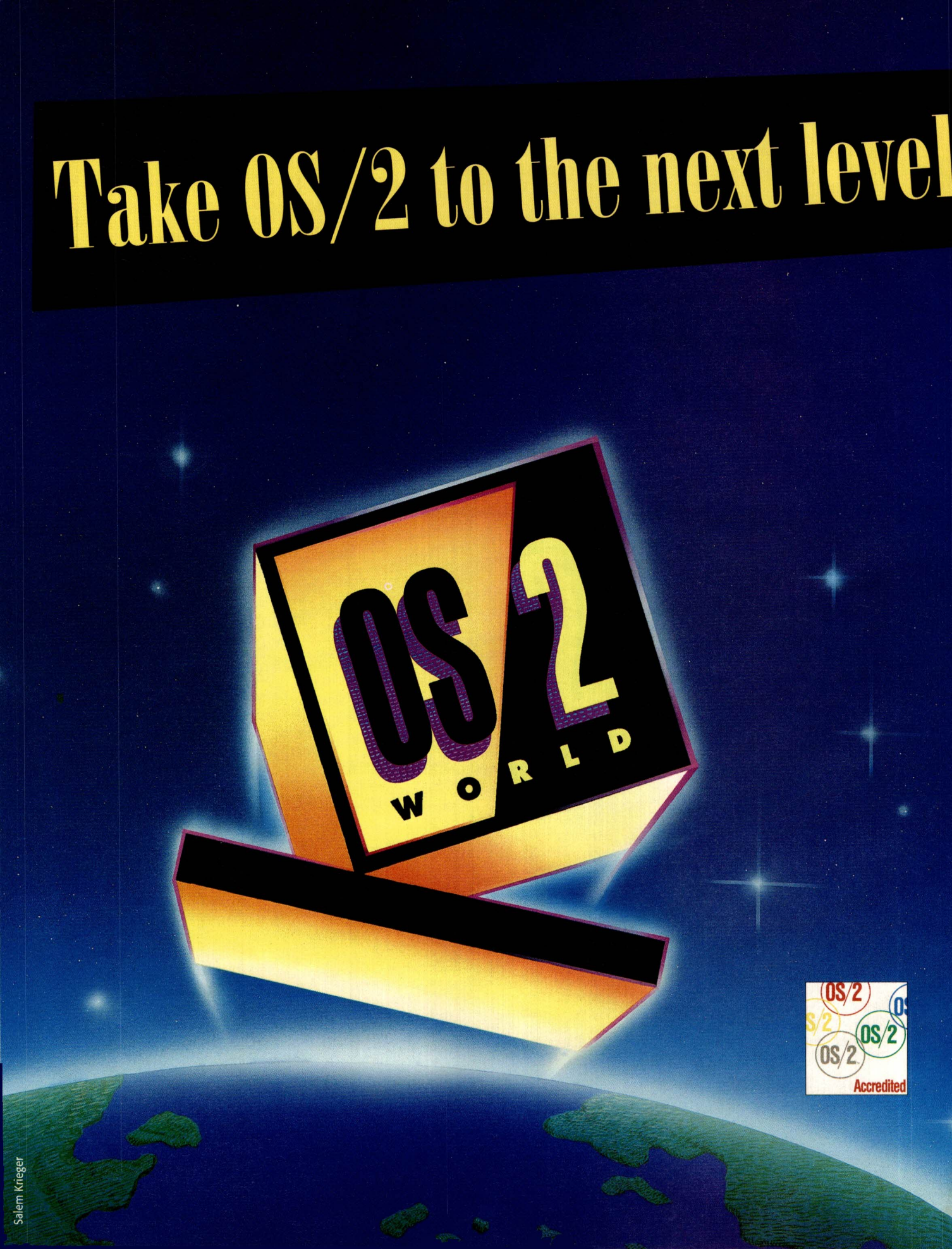

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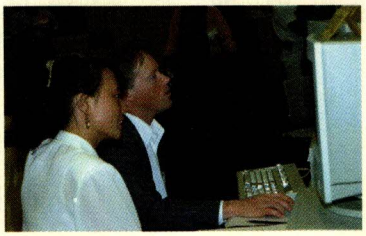

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Connecting to OS/2 Warp

Networking with OS/2 should be easier than ever. By Wayne Rash, Jr.

"OS/2 is an important platform for us," says Dawn Drake, Novell's Senior Product Manager for NetWare clients. Drake echoes an opinion held by many in the business of networking. OS/2, especially in view of its impressive sales following the introduction of OS/2 Warp 3.0, is being treated equally (or nearly so) with Microsoft's MS-DOS and Windows products. In fact, companies that make networking products are rushing to make sure that their products work with OS/2 Warp.

The result of this connectivity scramble is that networking with OS/2 Warp is easier than ever before. In fact, in some cases, networking with OS/2 Warp is nearly automatic. Still, there are differences between the way networks work with OS/2 Warp and the way they work with DOS. Some of them are due to the inherent differences between the operating systems themselves, and some are due to the way third-party vendors support them.

A great deal depends on how vendors view OS/2 Warp and how they view the network operating system with which you plan to use OS/2 Warp. For example, you'll find a lot more support for Novell NetWare, especially the older version 3.12, than you will for LANtastic for OS/2. Fortunately, OS/2 is a solid base on which to build a networking solution, and vendors are taking advantage of that. While not everything works yet, most things do, and connecting OS/2 Warp to other networking solutions is as easy as connecting MS-DOS and Windows—sometimes, it's quite a bit easier.

Sorting out connectivity paths

One of the challenges that IBM faced when designing connectivity solutions for OS/2 was the multitude of choices. Local-area networks (LANs) commonly use either NetBIOS or Novell's IPX/SPX (internetwork packet exchange/sequenced packet exchange), while a few use Apple's AppleTalk. In addition, many wide-area networks (WANs), as well as LANs that have to support UNIX machines and applications servers, use TCP/IP (transmission control protocol/internet protocol). These protocols, which are the means by which computers move information through the network, all have advantages and disadvantages, and most can work with one of several network operating systems.

The network operating systems that control the operations of the network servers, and thus the management of the network itself, use those protocols when they communicate. However, each NOS has to have interface software with which it can communicate. Depending on the type of network connection, and the use to which that connection might be placed, the interface software might be designed for use as a client or as a server. IBM had to design its OS/2 connectivity suite to work with the major network protocols as well as the major network operating systems.

To make matters more challenging for IBM's engineers, there's not always a direct match between the protocol and the network operating system. NetWare networks usually use that company's proprietary protocol, IPX, for example. However, Novell clients can also communicate with NetWare servers using TCP/IP. Likewise, IBM networks are moving to TCP/IP as a standard protocol, but many users prefer to continue using NetBIOS. Microsoft's Windows NT Server, meanwhile, works equally well with IPX, TCP/IP, or NetBIOS, which would be fine, except that these network operating systems don't necessarily communicate in the same manner just because they use the same protocol.

The NOS knows

IBM has solved many connectivity problems by working with network operating system vendors to make sure that its OS/2 and OS/2 Warp products support networking as seamlessly as possible. When it needed a client for OS/2 Warp Connect (which shipped just as this article was written), for example, IBM teamed up with Novell to write the client software. This ensured a package that worked properly with OS/2 Warp and NetWare. Unfortunately, such arrangements aren't always possible, which is one reason that connectivity between Microsoft's Windows for Workgroups and OS/2 Warp, or Windows NT and OS/2 Warp, isn't as smooth as it should be.

To make matters more complicated, some vendors of third-party products ignore OS/2 Warp, preferring to concentrate on

Table 1: OS/2 Warp Connect network support.

Network OS	Protocol Support	Notes
LAN Server	NetBIOS	Supports TCP/IP encapsulated NetBIOS
Novell NetWare	IPX/SPX	Supports NDS in v. 4.1
Windows NT Server	NetBIOS	Also supports NetWare file and print services for NT
Windows 95 Peer	NetBIOS	Also supports NetWare file and print services for Windows 95
Windows for Workgroups	NetBIOS	
NFS	TCP/IP	Requires optional package for client and server support
Banyan VINES		Requires thirrd-party client package
LanTastic	NetBIOS	Can server as peer resource (but cannot access other clients)

the larger DOS/Windows market. DataRace (San Antonio, Tex.), for example, makes a combination modem and Ethernet card for PCMCIA slots that uses a software modem to speed up communications and reduce cost and power consumption. Such a modem would be a natural for OS/2's multithreaded environment, but this product is only available for Windows. On the other hand, many similar products, including a PCMCIA Ethernet Modem from Xircom, include full support for OS/2.

The Novell universe

Novell's support for OS/2 is both broad and deep. The networking giant provides complete client support for OS/2 2.11 and OS/2 Warp 3.0. Currently, that support includes a full 32-bit client for OS/2 that supports Novell's NetWare Directory Service, and includes an object-oriented client package. An object-oriented network management station for OS/2 that takes full advantage of OS/2's object-oriented design and Novell's similar management philosophy is due to arrive in the near future. The Novell approach, in which everything is an object, works well in the OS/2 environment.

Novell's NDS support means a number of important things to OS/2 users on NetWare LANs. The most obvious is that it provides a secure single logon to the entire network. User authentication to network resources is handled by NetWare in a secure, encrypted message stream. For example, you can log into a NetWare version 4.1 file server as you would now, by entering your user name and password. Once you've logged in, however, you needn't do it again. Access to databases, mail systems and mainframes is handled through NDS, and is transparent to the user. They just use the network without having to worry about where a resource might be located, or where they are while they're logging in, for that matter.

Because NetWare Client for OS/2 supports NDS, users of OS/2 workstations can take advantage of the advanced management capabilities offered by an NDS network. Electronic mail systems just require sending messages, for example, so it involves none of the multiple logging in that's currently required on other networks.

Of course, other networks, including IBM's OS/2-based LAN Server, offer a single logon as part of their domain-name service. The difference is that a full directory service such as NDS or Banyan's StreetTalk, offers capabilities far beyond just single logons. Other applications can use the directory service information, for example, without requiring additional databases or input from users or managers.

This support for Novell's NDS gives a significant advantage over some of its competition. Microsoft, for example, writes its own NetWare client software, but doesn't support NDS. This means that Windows 95 and Windows NT users with NetWare version 4.1 on their file servers suffer significantly less functionality than OS/2 users under the same conditions.

Earlier versions of NetWare, such as version 3.12, which is still the most widely used version, don't directly support NDS either, but they can be managed by the object-oriented tools available to network managers with NDS, and the NetWare 4.1 clients work with them as well.

Novell's estimated 70 percent market share makes such support of OS/2 vital for corporate users, but it's not the only corporate networking solution. For that reason, most of the network users that aren't using NetWare are probably using IBM's LAN Server.

Big Blue's approach

Unlike network operating systems that are complete systems in their own right, IBM's LAN Server is actually an application that runs under OS/2. Version 4.0, the one IBM's currently shipping, works with either OS/2 Warp or OS/2 2.11. It's the easiest for network managers used to OS/2 to support, since they're using the same operating system for the client and servers.

OS/2 LAN Server supports both NetBIOS and TCP/IP. OS/2 Warp Connect clients should be able to use either protocol, although IBM encourages TCP/IP. For users on an enterprise network, TCP/IP has the advantage of being able to be supported by a router, while NetBIOS must be bridged, which can be more difficult to manage in an enterprise environment.

Because the client and server are produced by IBM, support for LAN Server suffers less from the finger pointing that sometimes happens between network operating system vendors and third parties. For this reason, OS/2 Warp worked properly with LAN Server client software from the day it shipped, and LAN Server users avoided many of the difficulties experienced by users of other network operating systems.

OS/2's 32-bit architecture makes it well-suited as a platform for a network server. In addition, because LAN Server is an OS/2 application, the server can also be used as a workstation, although such use entails a number of risks that most network managers are unwilling to take, such as the chance that the user of the workstation that's also running LAN Server might decide to reboot or simply turn off their computer, forgetting that they're taking the network operating system down with it. Because of this risk, most managers of all but the tiniest networks reserve the server's client capabilities for specialized tasks, such as running network management software.

As a client, OS/2 connects nearly seamlessly to LAN Server, as you would expect. Network resources simply appear on the desktop as if they were attached to the workstation itself. Even installing the LAN Server client is nearly seamless, since OS/2 Warp Connect should ship with that client as a part of the basic package. If you have OS/2

Warp, or plan to use OS/2 Warp Connect, you can have LAN Server connectivity with almost no effort.

The Windows NT server problem

Despite its common heritage with LAN Server, Microsoft's Windows NT Server doesn't provide so seamless a solution, partly due to neglect on Microsoft's part. The company has been at odds with IBM recently and, as a result, development of OS/2 clients for NT Server has taken a much lower priority than other development.

The frustrating fact for most users is that there's little reason that the two products shouldn't work together. Both Windows NT and OS/2 use virtually identical software interfaces, and they use the same domain-based network-management approach. The problem is that the means of browsing for attached resources, such as file servers, differs between the Microsoft products and OS/2. The differences are minor, but they prevent quick and easy solutions.

On the other hand, communications between OS/2 and Microsoft networks are certainly possible, but they take more effort than they should. Essentially, communications can be accomplished in two ways. The first method is to use the existing domain-based access, and enter the server connection information into the client manually. This approach requires that you know the exact name of the domain to which you want to attach.

If you're using an OS/2 platform as a server, either with LAN Server or OS/2 peer services, you may find that you cannot see the OS/2 machine from the Microsoft client. If however, you enter the specific name of the domain and path to the OS/2 machine in the Microsoft File Manager network connections dialog box, you'll have the OS/2 service appear, allowing the Microsoft client to attach normally to the OS/2 machine.

Attaching an OS/2 client to a Windows NT Server works the same way; although with OS/2 Warp Connect, browsing works in some releases. (At this writing, OS/2 Warp Connect is still in testing, so there are differences in the way some packages work at press time and the way they'll work when they're available commercially.) In fact, when it readied the network clients for OS/2 Warp Connect, one of the goals for IBM engineers was to make sure that their product worked with NT Server.

The second way that an OS/2 platform can attach to a Microsoft network is by using NetWare client services. Both Windows NT and Windows 95 support limited NetWare file and print services, and appear on the LAN as if they were a NetWare file server. If your network already has Novell, there's no reason to add complexity in the form of additional protocol stacks to each client if all you need is occasional access to a Windows NT or Windows 95 machine's resources, as long as those resources are limited to file sharing and printer support.

Note that, for NetWare file and print services to function properly, NetWare version 3.12 server must be available on the network to provide bindery information (the Bindery is a database on a NetWare server that provides logon and security information). Organizations with NetWare 4.1 must run Bindery emulation for this Microsoft solution to work.

Microsoft Windows NT is also a popular platform for application services, especially as a database server. In this instance, there are few special considerations for OS/2 platforms, since no direct interaction occurs between the client and the application server. Normally, Windows NT database servers communicate using IPX/SPX or TCP/IP, both of which OS/2 supports, and the communications take the form of SQL (structured query language) messages and requests, and responses to those requests. Under those circumstances, the database server could just as easily be running OS/2 or UNIX as Windows NT.

Clinging to VINES

Banyan VINES is a popular network operating system for organizations with very large enterprise networks. Despite its very small market share, Banyan's customers are among the largest corporations and government entities in the world, and the crossover between Banyan and OS/2 is considerable. Unfortunately, as of press time, IBM had not provided a Banyan client for OS/2 Warp Connect, and there were no indications that one was due in the near future.

Fortunately, Banyan itself released a full 32-bit multithreaded version of its client for OS/2 2.1, and that version continues to support OS/2 Warp and OS/2 Warp Connect. Unfortunately, with VINES 5.5, Banyan no longer supports NetBIOS connectivity, so network-aware applications that depend on this capability must either be used with an earlier version of VINES or changed so that they don't use NetBIOS.

In general, Banyan customers receive the same level of support they have with earlier versions of OS/2, which means that the client software comes from Banyan rather than IBM. Fortunately, Banyan's software fully supports that company's highly regarded StreetTalk directory service, providing a full suite of such services to applications and users. Banyan's OS/2 users get network-wide logon capability, and a secure means of access to network resources.

In the NIC of time

Software is only part of the picture. Despite the generally favorable picture for supporting OS/2 as an operating system in a networking environment, nothing works if the hardware isn't there to provide a means of communications for the software. The network interface cards must support the OS/2 client or server software with drivers designed for the target network operating system.

Some manufacturers support OS/2 routinely. Intel, for example, includes OS/2 support as a part of the standard package of software for its NICs. This support is delivered both for NetWare clients and for OS/2 LAN Server clients. Likewise, 3Com delivers OS/2 support for its NICs. Unfortunately, not all companies provide support routinely, although some will make OS/2 drivers available on request or for download from company bulletin board or Internet sites. A few NIC manufacturers, especially some lower-priced and offshore products, limit their support to NetWare and DOS/Windows clients. Fortunately, many NICs are compatible with one of the more popular versions, usually the Novell NE-2000 network interface card, with is supported by OS/2 and most client packages.

Nevertheless, it's important to ensure that the network hardware you're planning to use with OS/2 is compatible. The easiest way to do this is to buy network equipment from IBM, which makes a competitive line of Ethernet, and Token

Ring cards for most popular computers. Other major manufacturers, including Intel and 3Com, support OS/2 in its client and server configurations. You should note that, depending on the NIC, client and server software can vary greatly, and support for one doesn't necessarily mean that the other function is also supported. It pays to check.

Higher-end cards, such as those for ISDN or FDDI, and cards for new communications protocols, such as 100Base-T or 100VG versions of Fast Ethernet can be more of a problem. In many cases, the market for these cards is just opening and, while their vast bandwidth would seem to be a natural market for OS/2 workstations, the nature of the market is such that most of these products are sold as NetWare server solutions first, and only as OS/2 client or server solutions later if the market develops.

Again, the larger companies with an early commitment to OS/2 are the ones to watch. Unfortunately, problems remain with NIC support, and they're not all related to the third-party vendors. IBM itself has thrown a significant monkey wrench into the works because of a bug in OS/2's network interface card installation routines.

The installation bug, which affects both LAN Server 4.0 and the existing beta version of OS/2 Warp Connect, fails to set some network interface cards correctly when doing an automated network installation. Because of this bug, OS/2 can crash in some cases, and fail in other cases to connect with the network. The solution to the installation problem is to perform the custom installation process and choose your own network interface card settings.

OS/2 as your connectivity platform

While the situation is by no means perfect, OS/2 is turning out to be the network connectivity platform of choice for many users. Its 32-bit multithreading architecture lends itself to the needs of power users, while at the same time supporting users who need to be able to support multiple protocol stacks connected to a wide range of computing and resource platforms. With OS/2 and OS/2 Warp Connect, it's no problem to maintain simultaneous connectivity to a NetBIOS server and a NetWare server while maintaining a TCP/IP stack for connectivity to the Internet or another wide-area network.

Even better, because of the flexibility of OS/2's architecture, users can have all of their network connectivity use the same network interface card, or they can install multiple cards in the same workstation. Likewise, they can take more advantage of high-speed, high-bandwidth communications, while at the same time continuing to perform useful work with their applications. This much power is well beyond what's available to users of Windows, but it's well within the needs of today's power users. For them, OS/2 and OS/2 Warp Connect form the basis for the nearly perfect network solution.

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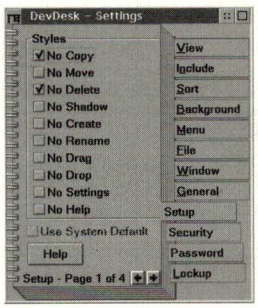

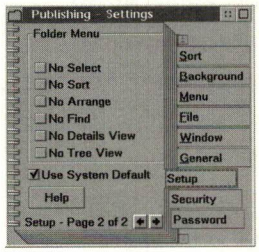

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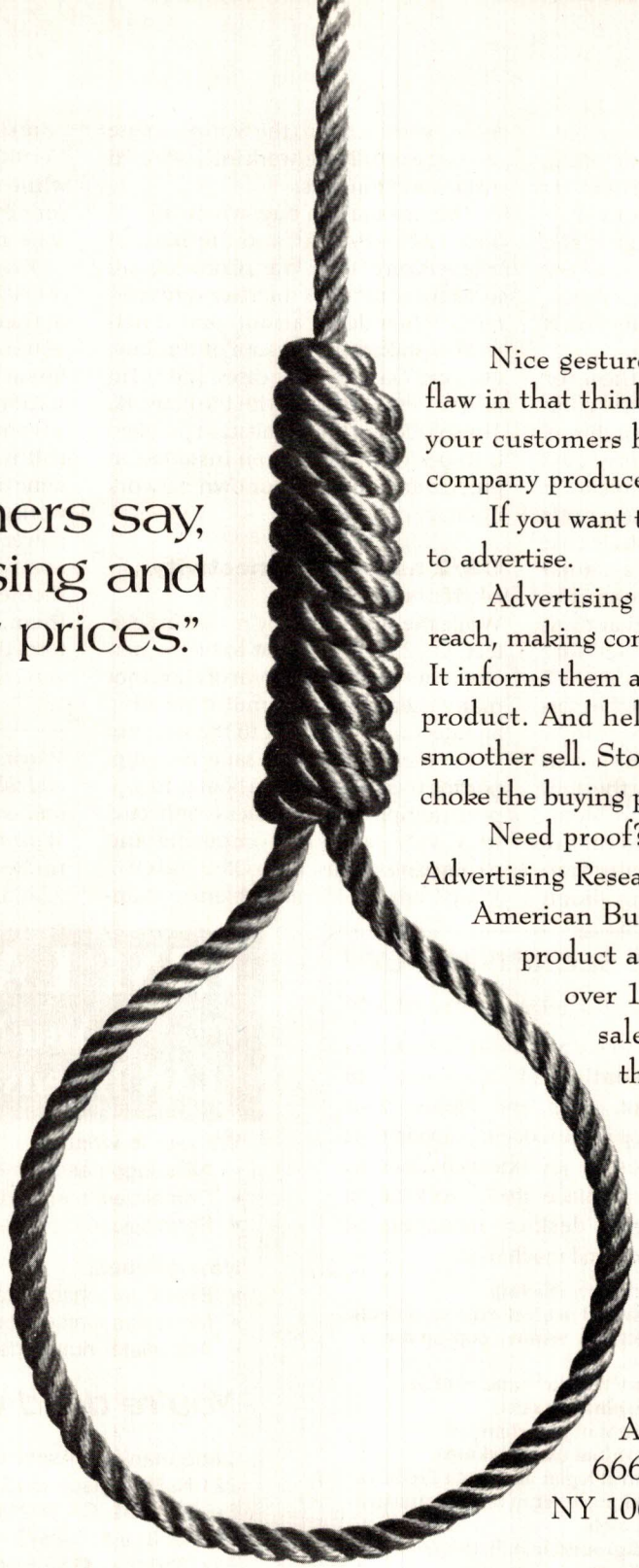

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Regular or Extra Crispy?

What's the difference between OS/2 Warp for Windows and Full Pack?

By Paul Penrod

First, there was one version of OS/2 Warp 3.0. Then there were two. IBM introduced OS/2 Warp Full Pack (more technically, "OS/2 Warp including DOS and Windows Support") several months after the original OS/2 Warp to address the needs of folks who wanted to have Win-OS/2 instead of wrapping around a native Windows environment.

With such a staggered scheduled, naturally, the question arises concerning the differences between old and new. Let's take a look, and see what we find. Please note that this discussion will be fairly technical, and looks at many of the internals of the operating system. The average user won't need to know many of these specifics to use either version of OS/2 Warp.

It didn't hurt IBM that OS/2 Warp made a sizable dent in the royalties paid to Microsoft for Windows code shipping with OS/2.

In the red trunks

The original OS/2 Warp 3.0, in the red box, is the follow-up to OS/2 for Windows 2.11. The box says "Enhances your existing DOS and Windows," and it's generally referred to as OS/2 Warp for Windows. It's claim to fame, other than being the first release of OS/2 3.0 generally available, is its ability to run a native Windows environment without having to install Win-OS/2, IBM's recompiled version of Microsoft Windows. For IBM, this strategy did two things. First, it provided a means of selling OS/2 to customers who already had Windows, and did not wish to purchase another copy vicariously. It gave the customer all the benefits of OS/2's multitasking, crash protection, DOS compatibility, and OS/2 native environment, while still enjoying the use of their Windows applications, thus preserving their investment. The second benefit for IBM was strategic. It sent a message to consumers that OS/2 Warp was a product that could provide immediate benefits and productivity for a small price and be useful on their system as it currently existed. It also didn't hurt IBM that OS/2 Warp made a sizable dent in the royalties paid to Microsoft for Windows code shipping with OS/2.

In the blue trunks

While OS/2 Warp was a step up from OS/2 for Windows 2.x, for some, the attraction of running Win-OS/2 over native Windows was strong. It meant, among other things, that the user did not need to buy DOS or Windows, or even run any of it on a FAT file system. In essence, you got all the benefits of OS/2 Warp, plus a stable Win-OS/2, plus the High Performance File System (HPFS), which does not fall apart when you sneeze wrong, as FAT is prone to do. Thus, we had the release of OS/2 Warp in the blue box labeled "Includes DOS and Windows Application Support," informally known as OS/2 Warp Full Pack.

The latest version of OS/2 Warp, known as OS/2 Warp Connect, will be available in two flavors corresponding to OS/2 Warp for Windows and OS/2 Warp Full Pack. In this article, we'll just talk about these two products, with the discussion including the corresponding OS/2 Warp Connect products.

Win32s on OS/2 Warp

As part of a transitioning standard of 32-bit Application Program Interface (API) for Windows applications, Microsoft introduced the Win32s API as the bridge between the 16-bit world of DOS/Windows and the 32-bit world of Windows NT. To accomplish its goal of implementing Win32s, Microsoft uses Virtual Device Drivers, called VxDs, as the means of providing this support inside the Windows 3.x environment.

VxDs, by their very nature, have to run at a very low level within the operating system, called Ring 0, since they provide the interface and ownership of the virtual device under their control. It is because of this one attribute that IBM made the conscious decision not to load VxDs under OS/2 Warp as they would Dynamic Link Libraries (DLLs). By load-

ing a VxD into OS/2 Warp, a Windows application would have complete access to the hardware, bypassing OS/2's protection scheme designed to intercept and handle direct calls. If the VxD was buggy, or the Windows application ill-behaved, the results would be about the same as poking a stick between the spokes of a moving motorcycle: OS/2 Warp crashes, taking every running application with it.

Despite complaints of non-VxD support, IBM did an old but very clever hat trick to compensate for the lack of VxDs under OS/2 Warp. Instead of trying to load a VxD directly and attempting to manage its activity, OS/2 Warp loads an equivalent driver, also called a Virtual Device Driver (VDD). When you stop and consider the basic functionality of most operating systems, it becomes quite evident that a majority of the functions created to handle housekeeping and other tasks are similar if not identical in function to those that exist in other operating systems. IBM takes advantage of the similarities by spoofing the Windows application into thinking it's talking to a Win32s VxD, when in reality, it is talking to an OS/2-native VDD that is cross translating between the Windows application's driver calls and OS/2 system calls.

A good example of VDD spoofing happens with the communications driver under Windows for Workgroups. In Windows 3.0 and 3.1, the *comm.drv* driver was implemented as a regular Windows driver. OS/2 could handle it, since it was a real-mode driver and could be run in a VDM without special support. When Windows for Workgroups was released, *comm.drv* was changed to take advantage of what VxDs had to offer. This approach created a problem for OS/2 Warp. When Windows started with the new *comm.drv*, OS/2 Warp originally could not handle the communication services and, as a result, programs like WinCIM and Prodigy ceased to function properly. By writing a VDD to handle all the functionality that Windows' *comm.drv* was responsible for and allowing the VDD to interface with Windows applications as if it were Windows' *comm.drv*, OS/2 Warp now handles communications under Windows.

Keeping up with Microsoft

As with all silver linings, a is cloud attached. For OS/2 Warp, one of those clouds happens to be Win32s. When you don't own or set the standard you support, you play a constant game of catch-up that can leave you hurting if you are not careful. In the case of Win32s, it is Microsoft's shifting revisions that cause the biggest headaches within IBM's OS/2 development team.

Keeping up with changes to the Win32s API is not trivial by any stretch. It takes a lot of resources to update, then, more importantly, test the updates to ensure stability. One of the barometers used to gauge the necessity of spending time and money to provide changes in Win32s support comes directly from customers, primarily in pressure applied to support a currently popular application such as AutoCAD Release 12 for Windows.

Currently, both OS/2 Warp for Windows and Full Pack support Win32s version 1.15, with 1.2 planned for later. A decision has yet to be made (as of this writing) whether version 1.2 will be available as a downloadable update, included in a fix pack, or by tagging along in a manufacturing refresh.

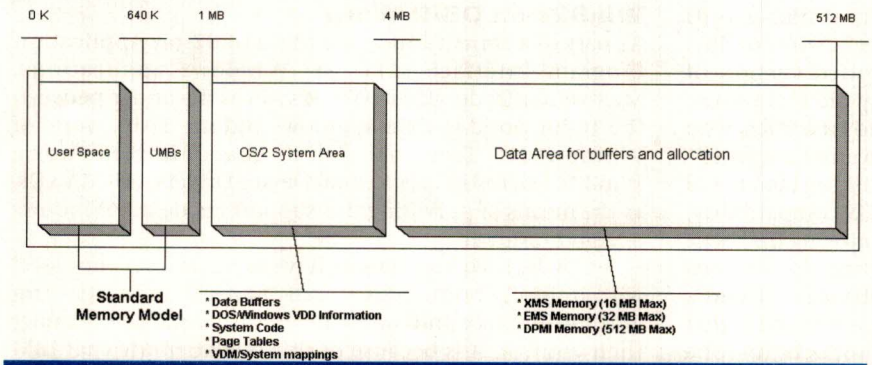


Figure 1: The DOS VDM memory map.

Performance

Who's fastest: OS/2 Warp for Windows, OS/2 Warp Full Pack, or Windows 3.11? That topic is hotly debated in certain quarters of the industry. Everyone seems to have an opinion on the matter, including those who have never used OS/2 Warp.

While no conclusive proof has surfaced that either version of OS/2 Warp is faster than Windows or vice versa, it is clear that a little explanation can go a long way to dispel much rumor and innuendo. Starting with OS/2 2.1, IBM commenced optimizing Win-OS/2 to make it more competitive with Windows 3.1. At the time, the marketing aim was pointed at OS/2 being a better Windows than Windows. To refute the claim, others would run benchmarks and performance tests, and rightly demonstrate that a better Windows than Windows was not a blanket claim that could be backed up in all areas of the operating system, except stability.

IBM conducted extensive tests and measurements of OS/2's memory footprint and system performance in the 4MB to 8MB memory ranges, so focus would be maintained on a realistic desktop environment. It was discovered early on that running the Windows 16-bit source code through six or seven different C compilers would grant an automatic 10% to 15% increase in performance, depending on whose compiler IBM used, and which code optimizations were selected. Armed with this knowledge, IBM's OS/2 development team could then hand-tune the existing code for better uniformity of performance.

Later, more speed was gained by moving large portions of OS/2's video and other subsystems to 32-bit implementations. As of today, in realistic terms, OS/2 Warp Full Pack can be measured up to 10% faster in some of its Windows activities than OS/2 Warp for Windows, due to the patching

overhead that takes place in memory. From a user's perspective, most people will not detect a noticeable difference.

Memory map

Memory, like disk space, seems to be in chronic short supply. As with system performance, memory mapping and limitations goad opinions from every direction. Anytime you place a bounding box on something, people have a tendency to complain it's too large or too small by comparison to something else. Such is the case with OS/2 Warp and Full Pack, which have identical memory models.

What is not well known about OS/2 Warp is how memory is actually mapped within the magical 512 MB and 4 GB limits that IBM has established as the current baseline memory models.

The DOS VDM

Mapping memory inside a Virtual DOS Machine (VDM) takes on an interesting twist, as shown in Figure 1. As you can see, the memory model is broken up into four broad areas. The lower 640K translates to user space within real-mode address, with 384K left over as the DOS upper memory. These two blocks constitute what IBM calls a standard memory model and looks exactly like memory configured in a native DOS/Windows environment. Where things start to differ is in the address range of 1 MB to 4 MB. It is here that OS/2 stores the following:

- Buffers for allocated data structures located above 4 MB.
- VDD information for DOS and Windows applications.
- OS/2 system code and page tables.
- Mappings for VDM and system processes.
- Input/Output buffers (such as file I/O).

The memory MODEL FOR AN OS/2 APPLICATION (16 OR 32-BIT) IS SIMPLER THAN THAT OF THE VDM,THE MAIN DIFFERENCE BETWEEN THE 16-BIT MODEL AND THE 32-BIT MODEL IS THE ADDRESSING BOUNDARY LOCATED AT 512MB.

Above 4 MB is where all the fun begins. This area of memory takes on up to three flavors of memory management: EMS, XMS, and DPMI. Under DOS programs, OS/2 will partition the virtual section between 4 MB and 512 MB into blocks of each type of memory based upon how the specifications of the VDM memory settings. Some practical limits do exist: For EMS, it's 32 MB, for XMS, it's 16 MB, and for DPMI, it's 512 MB maximum allocated space.

However, under Windows in a VDM, only one of the three memory types exist at any one time. For XMS and EMS, the Windows application can only address up to the maximum memory allocation allowed, with the rest of virtual memory inaccessible. On the other hand, if the memory scheme uses DPMI, the full 512 MB limit for 16-bit applications is still available for use.

Here, we run into the issue of the 512 MB limit, so let's step aside and peek at it for a moment. One of the major gripes about OS/2 from the Windows NT crowd has been the 512 MB per process limit. On the surface, it sounds plausible, but a brief examination will show that it really isn't a limitation at all, but provided for backward compatibility—negating the argument for those who need it.

Here is how it plays: 16-bit applications in DOS/Windows use one of three memory-management schemes to allocate what they need. Since DPMI gives the largest amount of memory to an application (up to 512 MB maximum) there is no need to give the 16-bit application any additional memory. 16-bit addressing won't allow an application to see a data area located above 512 MB anyway. So, why try? By providing the whole 512 MB addressable space within the standard OS/2 memory model of 4 GB per process, OS/2 allows 16-bit applications to maximize their data-allocation potential. This memory scheme also applies to 16-bit OS/2 applications.

As a side note, this backward compatibility will disappear at some future date, when little or no demand exists for 16-bit application-addressing support. Again, we see the preservation of software investment.

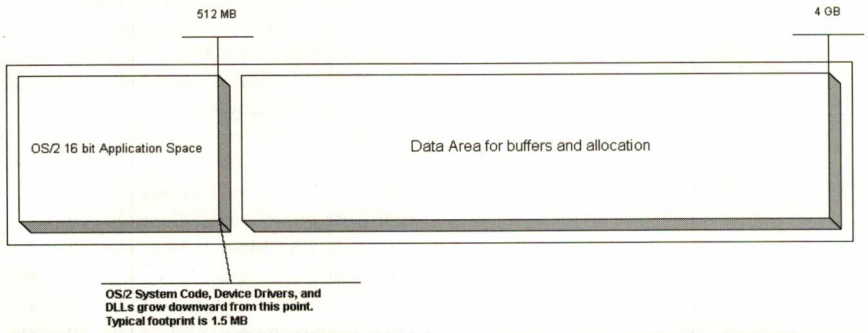

512 MB
4 GB
OS/2 16 bit Application Space
Data Area for buffers and allocation
OS/2 System Code, Device Drivers, and DLLs grow downward from this point. Typical footprint is 1.5 MB

Figure 2: The OS/2 16-bit application memory map.

The OS/2 model

The memory model for an OS/2 application (16 or 32-bit) is simpler than that of the VDM, as shown in Figure 2 and Figure 3. The main difference between the 16-bit model and the 32-bit model is the addressing boundary located at 512 MB, which we've previously discussed.

There is, however, one subtlety about 16-bit OS/2 applications. When segments are allocated between 4 MB

IBM used THE RELEASE OF OS/2 WARP FULL PACK AS AN OPPORTUNITY TO INCLUDE 75 OF THE HOTTEST BUG FIXES CUSTOMERS HAVE BEEN REQUESTING.

and 512 MB, regardless of their original size, OS/2 reflects these segments above the 512 MB boundary as full 64K segments. This approach allows for segment growth to occur without prematurely running out of memory to increase segment size, or stepping into another segment's memory area by mistake. The 16-bit OS/2 application can never "see" above 512 MB, but OS/2 can, and assists by shuttling data back and forth between the reachable portion of the data segment and the "nether regions" of the model.

One last comment about these memory models: OS/2 locates itself at the top of addressable application space and extends downward from that point for approximately 1.5 MB. For the 16-bit OS/2 application, OS/2 starts at 512 MB, while for 32-bit OS/2 applications, OS/2 starts at 4 GB and extends downward.

Viva la' difference?

Change is good, but consistency in operating system performance and feature sets can be a better attribute in certain circumstances; especially if you have a large company with many computers running OS/2 Warp.

IBM's original intent was to deliver OS/2 Warp Full Pack with the same basic Windows functionality as OS/2 Warp for Windows. But, as fortune would have it, Microsoft changed some Windows functionality after OS/2 Warp for Windows was released, so IBM added those new functions to OS/2 Warp Full Pack. While the list of new features isn't large, it is enough, in some cases, to take note of, and look for the Fix Pack #5 (which is the OS/2 Warp for Windows' fix pack) if these changes affect your system. Some of the changes added to Full Pack include:

- **Adding DMF (1.88MB) formatted floppy support to the floppy driver.** This addition was in response to Microsoft's recent use of high-density DMF disks in distributing some of its larger applications via floppy. Customers would then be able to install DMF distributable products on an OS/2 Warp system.
- **IDE drives with greater than 1,024 cylinders.** This one is a biggie for those who have Extended IDE (EIDE) drives larger than 528 MB. DOS and OS/2, by default, share a hard disk limit of 1,024 cylinders per drive. Providing this support natively removes the headache of making sure a specific device driver is available for the drive you have and that it works. Without native support, the potential headaches can be even worse if you mix and match different manufacturers' drives.
- **Cannon BubbleJet and all Media Vision sound are cards now supported.** Each time that IBM and hardware vendors create drivers for additional makes and models of computer peripherals, OS/2 Warp becomes more attractive to a larger base of customers.

Finally, IBM used the release of OS/2 Warp Full Pack as an opportunity to include 75 of the hottest bug fixes customers have been requesting. All things being equal, this is the one distinguishing difference between OS/2 Warp for Windows and OS/2 Warp Full Pack, other than the inclusion of Win-OS/2 code. Note that Fix Pack #5 for OS/2 Warp for Windows only provides 50 of the 75 APAR fixes found in Full Pack. Of course, it's too early to tell what's happening with the OS/2 Warp Connect versions. The initial release, the blue-box OS/2 Warp Connect Full Pack, was made available just as this issue was going to press, and the red-box OS/2 Warp Connect for Windows was still in beta testing.

OS/2 Warp Full Pack carries on the OS/2 banner in fine form, replete with new features, bug fixes and Win-OS/2 support. Even though it contains a few more fixes than its kissing cousin, remember that it is not always necessary to jump ship for that reason alone. If your system works with OS/2 Warp for Windows without the Fix Pack, you may not be a need to obtain and load it. Doing so may introduce problems that didn't exist before. So it goes with OS/2 Warp Full Pack. If you don't need or don't want Win-OS/2 support, then don't use Full Pack; just stay with OS/2 Warp for Windows.

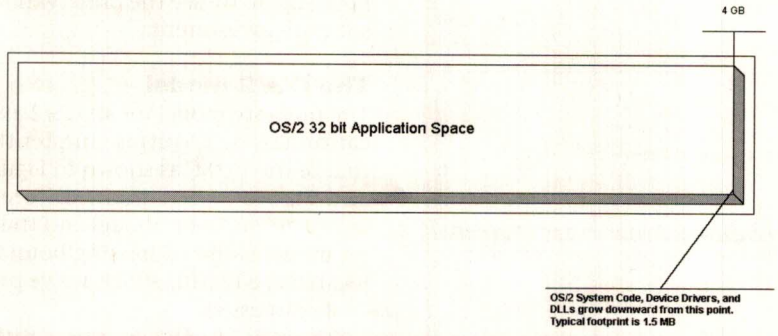

4 GB
OS/2 32 bit Application Space
OS/2 System Code, Device Drivers, and DLLs grow downward from this point. Typical footprint is 1.5 MB

Figure 3: The OS/2 32-bit application memory map.

Paul Penrod is a Portland, Ore.-based consultant specializing in operating systems, real-time process control, systems design, and unique software solutions. He has co-authored several books on computing and contributes to various computer periodicals. He can be reached at CompuServe 74022,546 or Internet furballs @net-com.com.

Seven Multimedia Kits

A look at "all-in-one-box" multimedia hardware bundles for OS/2. BY ESTHER SCHINDLER

From its description, OS/2 Warp is a multimedia-lover's dream. Multimedia support is integrated into the operating system, not grafted on. When you combine the sound, video, and CD-ROM support built into OS/2 Warp and then face the tedium of installing OS/2 Warp from the 39 floppy disks, purchasing a multimedia kit seems like a great idea. Rather than shopping around for individual components that may or may not be compatible with each other, multimedia kits include all the hardware you need. They are usually bundled with a selection of disks, giving you a good start on a CD-ROM library. Simple, right? At least that's the theory. The reality, however, is that things are never simple when it comes to multimedia.

I took a look at seven multimedia kits: Creative Labs' Digital Edge 3 Speed, Creative Labs' Sound Blaster Discovery CD16, Sigma Designs' ReelMagic CD-ROM Upgrade Kit, Megamedia Extreme, Reveal Explorer (MGX01), Reveal Quantum (MGX08), and Aztech Voyager. These were chosen based on one simple criterion: the vendor claimed to have OS/2 support.

If you're a novice (or not so novice) computer user, this may be the first time you have to take the cover off the system.

Sorting through the boxes

Each of the kits I looked at included a sound card, a set of speakers, and a CD-ROM drive, but they diversified from there. Some included hardware, such as microphones or headphones, some had MIDI support, and all of had some kind of utility software (see Table 1). Each kit also came with a variety of bundled discs (see Table 2).

The overall documentation quality was very good (except for a terse and not-well-translated manual from Megamedia). Reveal includes a videotape with their kit that explains how to install the card and software. The video was particularly well done, and would be especially appreciated by neophytes.

The CD-ROM drives were all double-speed drives (the Digital Edge 3x Sound Blaster kit comes with a triple-speed CD-ROM and was the only drive that offered a SCSI interface option). In all but one case, the CD-ROM drives connected to the sound boards and used proprietary interfaces and software drivers (this later caused problems when it came to OS/2).

The sound boards all boasted 16-bit sound. However, since none of the kits' documentation went into specific details, and they used different yardsticks to tout their capabilities, it is impossible to objectively determine what sound quality they really deliver. Needless to say, most of the kits' sound boards were not top of the line. If you just need something to play games, with a few sound effects and background music, any of these

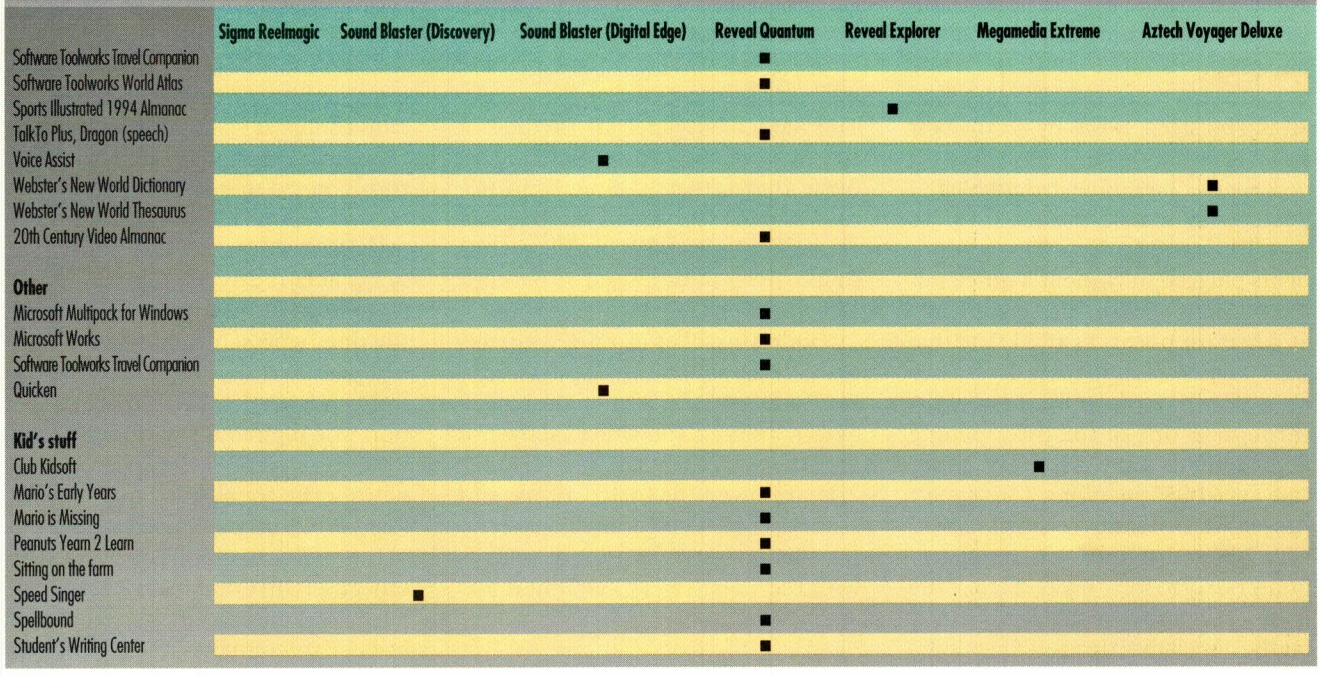
Table 1: What's Included?

	Sound Blaster Digital Edge 3x	Sound Blaster Discovery	Reveal Quantum	Reveal Explorer	Sigma ReelMagic	Megamedia	Aztech Voyager Deluxe
Sound card	16 bit ASP	16 bit	16 bit	16 bit	16 bit	16 bit	16-bit
CD ROM speed	3x	2x	2x	2x	2x	2x	2x
proprietary	■	■	■	■	■	■	
SCSI-2	■						
Speakers	good	good	excellent: 80 watt	good: 8 watt	good: 4 watt	minimal	Good: 4 watt
MIDI interface	■			■			■
Utility software	■	■	won't run in OS/2	■	■	■	■
Number of bundled discs	12	15	35	6	6	4	35
Microphone	■	■	■	■			■
Joystick			■				
Headphones	■		■	■			
OS/2 Drivers							
included with Warp	■	■					■ (sound)
"not yet available, or planned"		■	■	■	■		
Extra:					MPEG full screen video		
List price	$999.95	$449.95	$549.00 (street)	$249.00 (street)	$799	$249	$339

Table 2: Bundled software.

Games	Sigma Reelmagic	Sound Blaster Discovery	Sound Blaster Digital Edge	Reveal Quantum	Reveal Explorer	Megamedia Extreme	Aztech Voyager Deluxe
Bard's Tale							■
Battle Chess							■
Castles							■
Dragon Wars							■
Football Pro				■			
Indianapolis 500		■	■				
Interplay Classic Collection	■						■
Iron Helix				■			
King's Quest VI				■			
Lemmings		■	■				
Lord of the Rings							■
Mindshadow							■
Out of this World							■
Outpost							■
Rebel Assault			■				
Return to Zork	■			■	■		
Star Trek 25th Anniversary							■
Star Wars Chess				■			
Strike Commander				■			
Tass Times							■
The Horde	■						
The Psychotron	■						
Top Gun	■						
Wasteland							■
Wing Commander II				■	■		
7th Guest				■			
Educational/Edutainment							
Adventures (worldwide travel)				■			
Aldus Photostyler Special Edition		■	■				
Altimira Composer		■	■				
Compton's Interactive Encyclopedia	■						■
Compton's World Timeline							■
Consumer Information							■
CIA World Factbook							■
Dr T's Sing a Long				■	■		
Everywhere USA Travel Guide				■			
Graphics				■	■		
Grolier's Multimedia Encyclopedia		■	■	■	■		
Guinness Multimedia Disc of Records				■	■		
HSC Digital Morph			■				
Interactive World Atlas							■
Introduction to Classical Music				■			
Kai's Power Tools		■	■				
Knowledge Adventure America Adventure						■	
Knowledge Adventure Kid's Zoo						■	
Knowledge Adventure Space Adventure				■			
Knowledge Adventure Speed			■	■			
Knowledge Adventure Undersea				■		■	
Knowledge Adventure 3D Body				■			
Learn to use Windows							■
Macromedia Action!							■
National Parks, Family Guide				■			
Professor Multimedia							■
Software Toolworks Capitol Hill				■			
Software Toolworks Oceans Below				■			
Software Toolsworks Space Shuttle				■			

Table 2 (continued)



boards should suffice. If you want to start producing MIDI masterpieces or have a discerning ear, you might be disappointed.

The speakers included in each kit were okay. Not outstanding, not bad, just okay. The Megamedia kit's speakers were so mediocre, however, that if you decide to purchase it when their drivers are available, plan to buy a better class of speakers at the same time—you'll want them. At the other end of the scale are the excellent 80 watt speakers included with Reveal's Quantum kit.

All of the kits included a variety of applications and games. All of the bundled software was designed for a Windows/DOS environment, not OS/2. Keep in mind that companies change the software and hardware that is bundled with the kits, so you shouldn't blindly purchase one kit if, for example, you have your heart set on a particular title. I didn't check all of the 50-odd applications and games to see how well they ran in OS/2. If I had, this would have turned into a game-compatibility article.

Installation

Installing a multimedia kit is no fun even under DOS or Windows. If you're a novice (or not-so-novice) computer user, this may be the first time you have to take the cover off the system. Confronting IRQs, DMA channels, and the other nasty hardware stuff can give you headaches faster than a neighbor kid's drums. The installation can be daunting even when the process works perfectly, not to mention when you drop a screw into the works.

In general, multimedia installation is worse under OS/2. None of the multimedia kits' manuals mention OS/2 by name, much less how to troubleshoot an OS/2 system. If you don't know how to run OS/2's Selective Install, you won't find out here. Even worse, in some configurations, you may find that you have to add obscure parameters to **basedev** lines in your *config.sys*, a prospect that many people equate roughly with getting root-canal surgery. In general, you're on your own.

Before you start installing any hardware, it is probably a good idea to have a list of all the other hardware that is already installed in your system, including the IRQs, DMA channels, and drivers they use. (It is also a good idea to save a backup of your *config.sys* just in case something goes wrong and you need to back up to square one.)

So, how do these seven multimedia kits stack up? It's incredibly disappointing to have to report that four of the seven kits wouldn't install, but since each of them is promising OS/2 drivers (with fervor, in some cases), a comparison is still worthwhile.

The good news

Creative Labs Sound Blaster Discovery CD16 Digital Edge 3 Speed

The two kits from Creative Labs both include a sound board, CD-ROM drive, decent speakers, microphone and OS/2 drivers. The Discovery CD16 kit includes a double-speed CD-ROM that attaches directly to the sound board. The Digital Edge 3 Speed kit offers a

triple-speed CD-ROM drive that can be attached to a SCSI-2 board (not included) and also includes a pair of headphones and a MIDI interface. While the price for the Digital Edge 3 Speed kit is a bit steep, it was by far the best system I tested.

Because of an unrelated problem, I decided to install the kit prior to installing OS/2 Warp. The components plugged in without a hitch, but the OS/2 installation died completely at a certain point. I called Creative Labs' technical support at 10 o'clock on a Saturday morning. I got right through to one of the three people dedicated to answering OS/2 and "advanced OS" questions. The support people were friendly, willing, knowledgeable, and, it turns out, completely unnecessary to solve my problem. (The culprit was a flaky video card, which bit the dust at exactly the wrong time.)

After I replaced the video card, everything worked smoothly. Similarly, the Discovery CD16 kit installed without a hitch. OS/2 Warp saw both the Sound Blaster and the CD ROM drive, and everything worked right out of the box.

It's obvious that the company is committed to supporting OS/2. Besides having dedicated technical support personnel for advanced OSs, their CompuServe forum has a section devoted to the topic. They even provided an OS/2 utility file for download, including a multimedia game.

Aztech Voyager

The Aztech Voyager kit includes a sound board, double-speed CD-ROM drive that attaches directly to the sound board, fairly good 4 watt speakers, microphone, MIDI interface, OS/2 sound driver software and 35 bundled software titles.

During installation, OS/2 Warp recognized the sound card immediately, but the CD-ROM was invisible. I called Aztech's BBS and downloaded the driver (though it was labeled for OS/2 2.1), followed the instructions, and *voila!* a working multimedia system. Installation wasn't quite as painless as with the Creative Labs kit, but it was acceptable.

The not-so-good news

Reveal Explorer
Reveal Quantum

The Reveal Quantum kit comes with an astounding 35 CD ROM titles, excellent quality speakers, a joystick, and a sense of "completeness." It even includes a videotape, explaining how to open up the computer.

When I found no mention of OS/2 in the manuals, I decided to ask for instructions first. I called Reveal's toll-free, seven-day-a-week, 24-hour support. After 45 minutes on hold, I reached a churlish technical support representative who said that Reveal didn't support OS/2. A search of their CompuServe forum (in October 1994) corroborated that response (despite a friend's reports that he'd successfully installed a Reveal kit using the OS/2 Warp Beta II drivers). This situation was a little confusing since they were the ones who sent me the kit in the first place.

Even with detailed experimentation, the high-end Quantum kit still wouldn't work. OS/2 Warp recognized neither the sound card nor the CD-ROM drive, despite my trying several of the *config.sys* options mentioned by other users on CompuServe. However, OS/2 Warp did identify the sound card in the Explorer kit as a Sound Blaster Pro, and I had the distinct sense that, with a little more encouragement, *config.sys* edits, and time, I might have convinced the CD-ROM drive to be recognized, too. Nonetheless, prospects didn't look bright; I dropped my "average user" persona with the technical support people and talked with the folks in charge. It turns out that about 50% of the Explorer kits will work with OS/2 Warp, right out of the box. I wasn't among the lucky ones.

The prospects aren't as bleak as they sound. With OS/2 Warp's release, demand for OS/2 drivers went sky-high. In mid-December, Reveal announced its intention to provide OS/2 drivers. Those drivers aren't ready at the time I wrote this review, but the first driver (for the MGX05, a kit I didn't use) is expected within a few short weeks. By the time you read this review, the company expects to have OS/2-specific drivers available for most, if not all, of the rest of their product line.

It can't be too soon. While the company re-labels component parts under its own label (making it hard to know if OS/2 Warp did choose the

Now that I have multimedia on my computer...

None of the multimedia kits I examined include any OS/2 titles. However, that doesn't mean that you have a useless sound card; quite the contrary. First, OS/2 supports system sounds directly. Use the Sound object in the System Setup folder to sound enable your desktop (and, by extension, your applications). You define what *.wav* file OS/2 should play when you open and close folders, or when you shut down the system. If this sort of thing appeals to you, check out BocaSoft's System Sounds, which adds even more sound "events."

For fun, you'll find screen savers that use sound (BocaSoft's Wipeout and One-Up Corporation's Window Washer among them), and several shrink-wrap and shareware multimedia games: Galactic Civilizations, Aquanaut, Heli-Rescue. There are utility packages to play or manage your library of music CDs and *.wav* files. But these go just so far in a serious office.

A few applications take specific advantage of multimedia. For example, you can assign sounds to specific events in DeScribe. Your computer can sing "Dixie" when DeScribe is done printing, for instance, or meow when a merge process is complete.

right model), the kits themselves are comprehensive, including everything you could ask for at a reasonable price. (Note: since the original writing of this article, Reveal has released *some* of their drivers, and others are still in development. Among those released are drivers for the SC500 and the SC400 Rev 4G cards.)

Sigma Reelmagic

The Reelmagic kit is the only one that offers full MPEG full-screen digital video, in addition to the standard sound card and CD-ROM drive. When I installed the ReelMagic hardware into an OS/2 Warp machine, I never even got to try the Selective Install. The CD-ROM drive light came on when I powered-up the machine, and it remained on thereafter. My screen appeared in inverse video, too, but I decided not to let that bother me until after I'd run the setup program.

The Reelmagic card is completely software controlled; you set the DMA, interrupts, and all the rest through the installation program. This feature would be great—if only it worked. In my case, it never did. Under DOS, the setup program is supposed to kick-start the CD-ROM drive into responding to the right signals, but under OS/2, it never got the drive's attention. I got helpful, friendly advice from the Sigma technical support guy on CompuServe, who suggested that I run the installation under DOS. I don't even have DOS disks anymore.

To Sigma's credit, they gave me direct and honest answers. Four out of 10 OS/2 users seem to be able to get the kit to work—I wasn't among them. Like Reveal, Sigma has been impressed with the need for native OS/2 drivers for its equipment and has announced that they will be shipping their own OS/2 Warp drivers in June.

Megamedia Extreme

When I first contacted Megamedia, in the fall of 1994, its OS/2 drivers were under construction. Despite that, OS/2 Warp correctly recognized the Megamedia sound card as an ES688, so I hoped I could "convince" it to talk with the CD-ROM drive as well. No dice. Months after I first spoke with the company, the drivers are still under construction, and it is uncertain when they will be ready. It's a shame, because—despite a set of speakers that could be best described as "dinky"—the kit seems to be a good value for the money.

Recommendations

Look first at Creative Labs' multimedia kits. First of all, they worked, at least for me. That's always a good sign. Second, their technical support was friendly and helpful, and they weren't lost when OS/2 was mentioned. Third (and this is the most subjective), even though the Creative Labs kits didn't include as many CD-ROM titles as did, say, Reveal, I liked what they did include, and I felt I'd continue to use them for more than a week.

Aztech is a solid second choice. I liked the kit, though I wasn't thrilled that I had to call a BBS to get the proper drivers. I personally encountered no problems with this kit, but I did see reports online that users couldn't get sound concurrently from OS/2 and seamless Windows applications.

As far as the other kits go, you may or may not be one of the lucky ones to get the Reveal Explorer or Sigma Reelmagic to work with your particular system, but make certain that you can return the kit for a full refund if you can't get them to work under OS/2.

Finally, you could always break down and buy the components you need separately and create your own multimedia kit. You will probably still encounter driver and installation problems, and you won't get 35 CD-ROM titles, but you will be able to spend your money on the components that you feel are the most important, rather than accepting someone else's recommendations.

As OS/2 Warp becomes more successful, other companies, not only those covered in this article, will become more interested in supporting OS/2. Before you buy, don't be shy about calling them to ask about the current status of their OS/2 drivers, and make your own decisions accordingly.

Esther Schindler is a computer consultant and writer. She is a contributing editor to OS/2 Magazine, the sysop of the Ziffnet Executives On-line Forum on CompuServe, and coauthor of Teach Yourself Rexx in 21 Days, from Sams Publishing. You can contact her at 72241.1417 @compuserve.com.

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Put a Rhino in Your Modem

OS/2 telecommunications software as it should be. BY GEOFFREY HOLLANDER

When you first open the "Rhinodex," you find yourself looking at a notebook in which an index-tabbed view simulates a personal phone book. Icons (called "Rhinos") reside on their appropriate pages. Click on a Rhino and you open a terminal connection with that Rhino's target recipient. The application is RhinoCom, a powerful communications program with a simple and effective user interface.

RhinoCom's installation procedure is straightforward and simple. Choose full or selective install and go. My AT&T Paradyne Dataport 14.4 Fax/Modem started up and ran perfectly with RhinoCom's default modem setup immediately after installation. Originally uninstalled components of the program can always be added later and—a very important feature for OS/2 applications—the program can be easily uninstalled.

For those new to communications, RhinoCom includes a tutorial called "Coach." Coach guides you through many basic communications tasks and gives you a sense of how a Rhino session should be conducted. Advice about each menu on the menu bar is available—you can even turn Coach on or off from the Help menu. At any time during a session, you can also use commands on the Help menu for the online, context-sensitive help that's available for each configuration item and feature.

A configurable Status (control) Box attaches directly to the main window by default, or floats independently on the Desktop. The Status box can be shown, hidden, or moved as desired. Its contents can be extensively customized to show a variety of monitoring information (time on, time started, com port status, and so on), and hot buttons (for frequently performed tasks). Many items can be right-clicked to open to the Settings Notebook and page containing settings for that item. The Communications Notebook settings that affect a Rhino Session's operation are all contained in that session's Notebook.

Most of the power in this program comes from its ability to be modified and customized to fit your needs through its extensive use of macros.

A Configuration Notebook, in the familiar OS/2 Settings Notebook style, centralizes all of RhinoCom's configuration parameters in one easy-to-find location. Pages are included for: Window layout (main window size, position, scroll, menu, and title bar options), RhinoCom Config, Macros, Emulations (ANSI, VT100, and Data General), and Transfer (Text, Binary, XMODEM, YMODEM, Kermit, and ZMODEM file-transfer protocols.

During any given session, Session Logging creates a file copy of the time you spend online, while Transaction Logging retains a record of significant events performed during your session. You can also print screen sections or incoming data. A History feature is enabled using a scroll-back buffer of user-configured size. Lines of data are stored in this buffer as they scroll off the top of the terminal window—allowing you to review text received during a session without having to maintain a Session Log.

Most of the power in this program comes from its ability to be modified and customized to fit your needs through its extensive use of macros. RhinoCom uses two types of macros: key macros and named macros. A key macro is a macro that is assigned directly to a keystroke, or combination of keystrokes. The macro is then activated by pressing the assigned key or keys. In RhinoCom, key macros can be defined for most key combinations from the Macros page of the Notebook.

A named macro is identified by name rather than by keystroke. A named macro can be configured to appear on the Macros menu where selecting its name executes the macro commands. Named macros can be used in the program in other ways, as well. They can be "nested" (inserted) into other macros' definitions, executed from scripts, or accessed by mouse clicks in the terminal window. There is no effective limit to the number of named macros you can define. Named macros are defined on the Named page of the Settings Notebook. Both key and

named macros are available simultaneously during the program's operation. The scripting language used by RhinoCom is OS/2 REXX with communications capabilities.

Running more efficient communications by multithreading offers powerful functionality. For example, it's possible to use the History feature to scroll back and review previous screens while downloading a file in the same session. You can cut-and-paste using the OS/2 clipboard, enabling easy data exchange between applications, and resize the window, while running, without losing the terminal screen. You can build Rhinos while you are using one or more of them. RhinoCom can even run multiple modems, using multiple COM port communication configurations, in several simultaneous windows—uploading here, downloading there, and searching somewhere else.

RhinoCom can run multiple modems, using multiple COM port communication configurations, in several simultaneous windows

All in all, RhinoCom is not only a finely crafted communications program, but a true OS/2 application that is completely integrated with OS/2 Warp's system capabilities. RhinoCom is a powerful, reliable communications program that lives up to its name.

Geoffrey Hollander is the owner of Mail Pouch, a service bureau and consultation firm specializing in creating and maintaining databases—primarily for direct mail campaigns. He is a computer hardware and software review writer for several industry publications.

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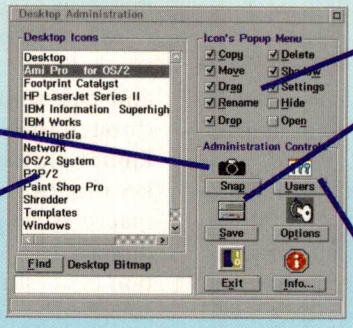

❶ Just setup your desktop the way you want and click this button to take a "snapshot".

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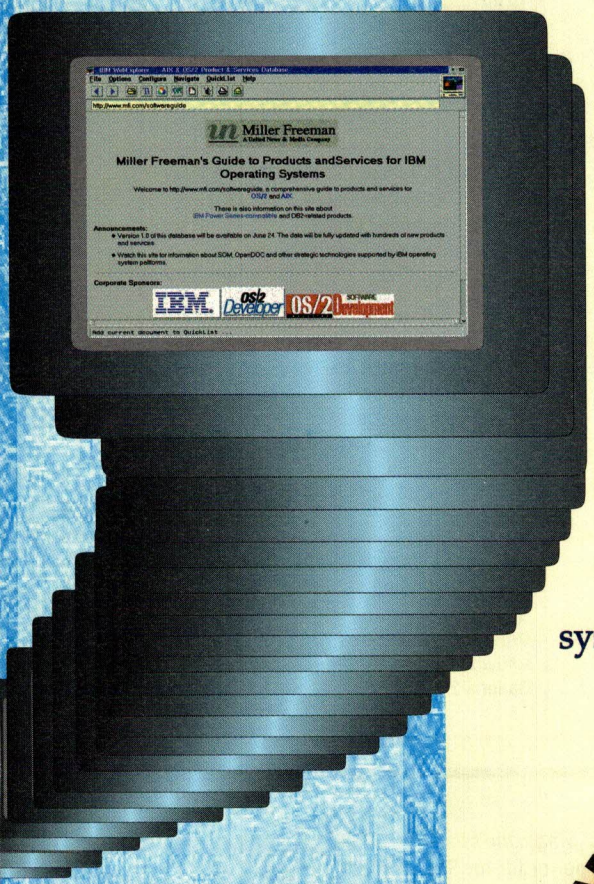

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Impos/2

Good solid image processing at a reasonable price. BY ESTHER SCHINDLER

Ordinarily, my reviews go like this: I tell you what a product claims to do, I tell you how well it delivers on that promise, and then I tell you if it's worth your hard-earned money. For Impos/2, however, I'm going to change the order, and give you my summary paragraph first. Buy this product. You won't be sorry. Okay, now I'll tell you why.

Using a graphic language

Impos/2 is an image-processing program for OS/2. It captures images from the screen, from the OS/2 clipboard, from a scanner, or from video overlay cards. It lets you display, edit, and manipulate those images with fine-tuned tools that do an excellent job.

If you need to view digital images, Impos/2 may fit the bill. It supports just about every graphics format available (including, but not limited to, TIF, GIF, JPEG, Kodak Photo CD, and Targa), and you can easily view multiple images concurrently. To convert an image from one form to another (GIF to BMP, for example), simply save the image as a different image type.

I used Impos/2 with a Hewlett-Packard ScanJet IIp, a black-and-white 400 dpi scanner. The scanner worked perfectly with Impos/2, without any cajoling necessary. Impos/2 includes a preview feature, so you can select the part of the image that you want to scan. You can also control the brightness and contrast during the scanning process.

Impos/2 supports the Logitech ScanMan 32, ScanMan 256, the the IBM 3119 PageScanner, the Mustek CG6000, the Highscreen Color 2, the Plustek Color 6000, and the HP ScanJet Plus, ScanJet IIp, ScanJet IIc, and ScanJet IIcx.

Scanning and viewing images, however, is just the beginning. Impos/2's real strength is its ability to manipulate and edit images. People who are graphics wizards use several standard tools, and Impos/2 provides a full set. They include brushes, airbrushes, line and freehand drawing, erase, smear, color cloning, contrast modification, mosaic, edge detection, and noise filters. You can convert images from or to black-and-white, 16 or 256 colors or grayscale, or true color, with a choice of conversion algorithms. There's more, but you get the idea. For those of us to whom "graphic bozo" is a more apt description than "graphic wizard," Impos/2's most appreciated feature may be its ability to Undo almost instantly.

I had more fun with Impos/2's graphics tools than should be legally permissible. I scanned color and black-and-white photos. I sharpened, cropped, and experimented. Finally, I exported the image for inclusion in the user group's newsletter. If you have to work with images, this is neat stuff. Even if you don't really need to use graphics, but you enjoy playing, this program is great. Impos/2 competes directly with several Windows graphics packages (such as Adobe Photostyler) and it fares quite well in the comparison.

A screen shot in the dark

Impos/2 also lets you capture screen images. While it does an adequate job, it doesn't have quite as many options for screen capture as does, say, One-Up's Open Shutter. For example, it won't automatically save the screen shot to a file with automatically-incremented file names (*pic1.pcx*, *pic2.pcx*, and so on). Also, Impos/2's screen-capture files are a bit larger than those captured with other programs (Open Shutter, in particular).

I used Impos/2 on a 33 MHz 386 with 16 MB RAM and a 33 MHz 486 with 32 MB RAM, both running OS/2 2.11. It also ran fine on a Pentium system running OS/2 Warp. Performance was always responsive.

I didn't need to refer

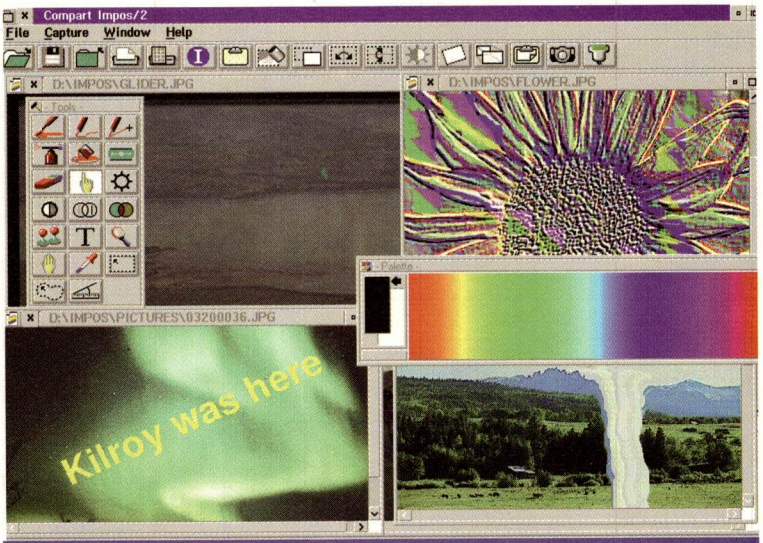

Figure 1: Impos/2 provides a complete suite of tools to help you clean up and edit scanned images.

to the documentation very often after installation. The manual devotes a section to the basics of image processing, which is valuable if you're unfamiliar with graphics terms. However, the text was translated from German, and it reads that way. The explanations never quite stop making sense, but it is awkward to struggle with language difficulties while you're trying to learn to use unfamiliar features.

A great deal could be improved by the inclusion of more full-screen images, including before-and-after examples of each effect. It would be nice to understand what happens when you use Emboss, for example, without having to experiment on live data. Extra screen shots would also help explain the few counter-intuitive things in Impos/2. For example, the frame's menu is attached to the top left corner of each graphic frame, rather than being added to the application's menu. This feature makes sense once you know how it works, but is never mentioned or shown anywhere in the manual. I spent half an hour looking for the Edit screen reference in the manual, and only the intervention of an experienced user solved the problem.

While Impos/2 performs a lot of functions, it doesn't have the granularity of control and preciseness of some of its Windows competitors. As one example, Impos/2 doesn't have Photoshop's ability to automatically determine the outline of an object in a scanned photo. On the other hand, Impos/2 is a lot cheaper than most of those Windows applications. It's also well integrated into the Workplace Shell. Drag and drop is fully supported, and graphic manipulation is one situation where drag and drop is extremely convenient.

My complaints about Impos/2 are nits, though. Overall, I'm incredibly pleased with this application. I recommend it to anyone who wants a graphics tool in their bag of tricks. Buy this product. You won't be sorry.

Esther Schindler is a computer consultant and writer. She is a contributing editor to OS/2 Magazine, the sysop of the Ziffnet Executives On-line Forum on CompuServe, and coauthor of Teach Yourself Rexx in 21 Days, from Sams Publishing. You can contact her at 72241.1417 @compuserve.com.

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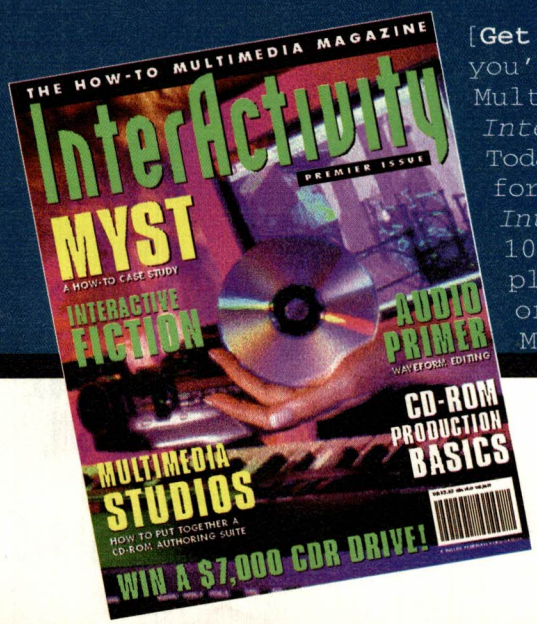

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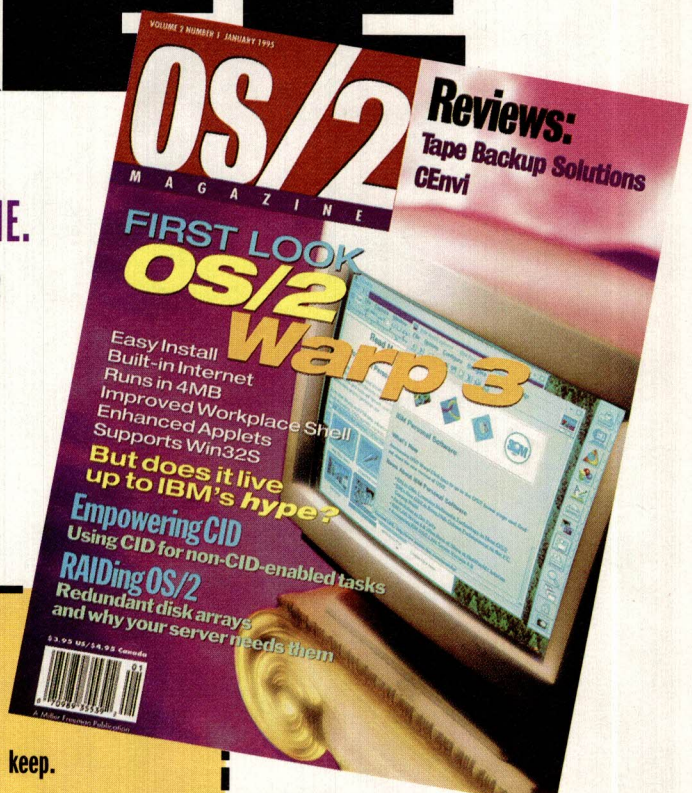

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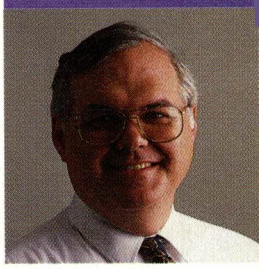

Hard Parts, Soft Parts

A NEW COLUMN TO HELP SOLVE OS/2'S NETWORKING CHALLENGES. BY WAYNE RASH, JR.

I'll bet you thought the problems associated with connecting OS/2 were solved by now. After all, IBM released OS/2 Warp Connect back in May and it's supposed to include networking support for just about anything. Right? So, why are we launching a new OS/2 connectivity column? Precisely because OS/2 Warp Connect has begun shipping.

Now that IBM has officially made networking a part of OS/2, many people will be trying to make it work. OS/2 Warp will become a more important part of the enterprise environment and users and managers will find that the new capabilities raise new questions. The rest of the OS/2 world, however, is also important.

Not every user with a network has OS/2 Warp Connect. In fact, not every OS/2 user even has OS/2 Warp. Many OS/2 users face the networking world with little help and have found new and interesting ways to make OS/2 an essential part of their enterprise network. Their ideas can do a lot to make life easier—or at least more interesting to other businesses.

The networked OS/2

One of the more challenging aspects of networking OS/2 is finding a way to get the network client product to install its networking software properly. These installation concerns vary depending on what version of OS/2 you happen to be using, but they exist for most users. Regardless of which OS/2 version you happen to be networking, you should at least know the basic steps. If you follow them, your network client should come up and run with few problems.

Why are we launching a new OS/2 connectivity column? Precisely because OS/2 Warp Connect has begun shipping.

The initial steps that are required to get the client package installed are the same for nearly any operating system. You have to unpack the card, change the settings of any jumpers or switches (a fairly unusual task these days), install the card into the computer, configure the card with software, and install the client software for the network operating system on your network. The details of some steps will vary according to the specific client you're using, the specific network operating system and network protocol, and the specific version of OS/2.

I'll use the Novell NetWare installation for most of the examples in this column. Some features of the process might be unique to NetWare, but most require similar actions regardless of the network operating system. I'll offer tips that could ease the installation of networking products at your company.

The hard part

The next part of networking OS/2 can be one of the most irritating if you already installed a network interface card in your workstation. If you don't, however, it's only a matter of taking notes. In short, you have to figure out which network settings your card is already using.

You need figures for a card address (usually a hexadecimal address, for example, 300) and usually an interrupt setting (which is typically IRQ5). On some network interface cards, this information is indicated by jumper locations. On others, the settings are only visible if you use special configuration software. Either way, you'll need to write down the configuration information because you may need it later.

Once you've figured out which settings you need (or you have decided on the appropriate settings, if it's a new card), you need to find an empty expansion slot on your computer, turn your computer off, and plug in the card. When you've done that, you might need to create the settings and you will probably need to boot DOS—either through dual boot or by using a floppy disk.

Most card settings are made using a configuration program that runs under DOS. Once you run the software, you should write down the settings. You'll need them later.

The soft parts

Once you've finished with the hardware, the rest is straightforward, if a bit tedious. If you're installing OS/2 Warp Connect, the only critical part comes when the process asks you to identify the network interface card you're using. Depending on your specific circumstances, you may need to provide a floppy disk with additional drivers and you may need to specify, or at least confirm, the settings that you wrote down earlier.

In many cases, OS/2 Warp Connect will not be able to figure out the correct network hardware settings on its own and the installation will fail, usually on the next reboot. You'll need to redo the installation. In that case, make sure you select custom installation so that you can specify exactly how your network hardware is set.

The OS/2 Warp Connect custom installation is still a fairly easy one compared to some other options. With the original version of OS/2 Warp, for example, and with OS/2 2.1, you needed to install network drivers after the operating system is installed. That is a detailed process, which is made easier only if you have a CD-ROM drive on the workstation that's running OS/2. If you don't, you'll find yourself creating installation disks and using those disks to install the networking client software.

Regardless of whether you're using Novell NetWare or OS/2 LAN Server, the process is the same, for the most part. Insert the CD-ROM that contains the network operating system into the CD-ROM drive on your computer, run a client-installation program, and follow directions. Hopefully, you'll remember the information correctly that you learned when you installed the network hardware.

The client install

Both the NetWare and the LAN Server CD-ROMs contain drivers for the more common network clients. Unfortunately, they're not necessarily easy to identify. For example, the Intel EtherExpress Pro network card driver is called EPROODI during the NetWare install. You'll also need to confirm or select other settings, including the Ethernet frame type. Most network operating systems support more than one type, and if you pick the wrong one, your client won't be able to communicate with the rest of the network.

Once you get past the settings, you may also be required to create configuration files. For example, with NetWare, a file called *net.cfg* tells the NetWare client software about any settings that differ from the default settings. Unfortunately, the proper way to make changes to this file is fairly cryptic, and while Novell provides a special editor with examples, much is left unsaid. Some familiarity with your network can help a lot in this area, as it's impossible to predict what you might need to include in that file.

Once you've answered the questions, the software will take over and copy files from the CD-ROM to the hard disk. If you've selected a floppy-disk install, you'll spend the rest of your life swapping floppies. Well, 15 or 20 minutes, anyway.

Talking to the network

You're not done yet. After you reboot OS/2, you still need to attach your computer to the network. You do so through a log-on screen or through a client-control panel, which is designed to ease the final steps. NetWare has a control panel. You'll need to attach to a file server, log on, and map a virtual drive letter to the network.

To perform the final step, you need to open the Novell folder on the desktop and open the NetWare Tools icon. You'll probably see a blank form. You should select the Drives menu and the Map menu item. You will see a dialogue box that lists the servers that are available on the network. Select one to which you have access, click the map button, and choose a virtual drive letter to represent that server. Accept the choice and save it with a name you can remember (*Default* works well) and you're all set.

Once you've attached your client to the network, you can make use of other services, depending on what's available. If you have a network printer, for example, you can gain access to it, just as you can access other resources, for example, the file server or application servers that support functions such as database access. NetWare services are available through the NetWare Tools icon. LAN Server appears in an icon that will say LAN Server or LAN Server and OS/2 Peer Resources. Either way, they're your key to the network.

Realizing THAT THE CHANCES OF SUCCESS ON THE 66 MHZ NORTHGATE 486 WERE SLIM, WE ALSO HAD LITTLE TO LOSE. BUT, SOMETHING WEIRD HAPPENED. IT WORKED.

Something cool

While we were preparing this column, we found ourselves in the embarrassing position of having more operating systems than computers—and we have quite a few computers in the lab. In any case, we needed to bring up OS/2 2.1 to refresh a faded memory of how the install process works with NetWare on that platform. Unfortunately, the only platform available was already running a beta of Microsoft's Windows 95.

Despite predictions of dire consequences, we grabbed the CD-ROM and installed OS/2 anyway. Realizing that the chances of success on the 66 MHz Northgate 486 were slim—OS/2 Warp and OS/2 Warp Connect won't even install on this machine—we also had little to lose. But, something weird happened. It worked. We can now dual boot OS/2 2.1 and Windows 95. Both work fine. Besides, it's a great way to learn just how similar Windows 95 really is to OS/2.

Wayne Rash, Jr. is a Contributing Editor and columnist for Communications Week. He's based in Washington D.C. and edits technology sections for The Washington Post. He can be reached at rash@access.digex.net or CompuServe 72205,221.

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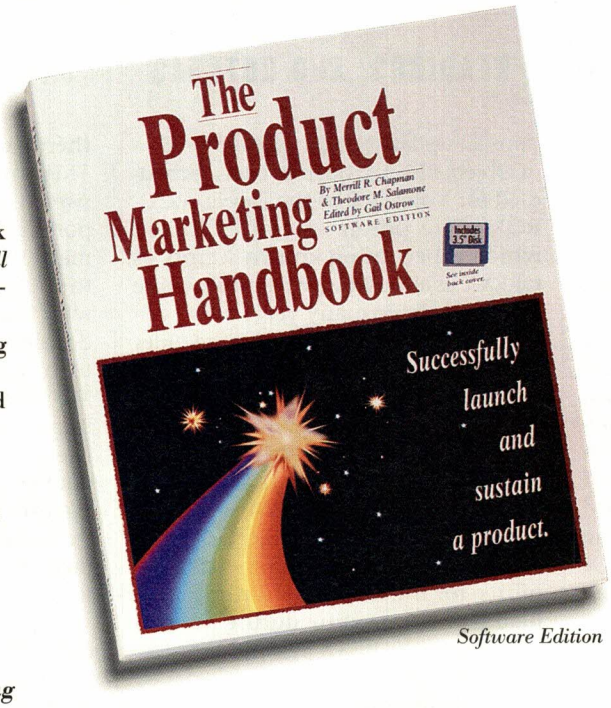
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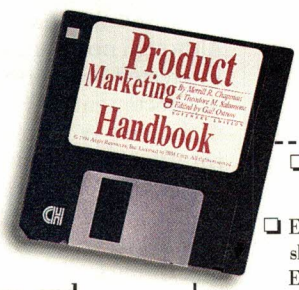

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Merrill R. Chapman has been in the software industry for 15 years and has seen firsthand the brilliant marketing techniques employed by industry giants and the catastrophic errors made by companies that are no longer in business. He presently consults with and trains marketing professionals in companies that include IBM, DataEase, SUN, Berlitz and WordPerfect.

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At the REXX Symposium

REXX HAPPENING, READINGS, AND GOTCHAS

BY DICK GORAN

REXX Events

The Sixth International REXX Symposium was hosted by the Stanford Linear Accelerator Center (SLAC) from May 1 through 3. The 1995 REXX Symposium Committee, composed of Cathie Dager from SLAC, Pat Ryall, Forrest Garnett from IBM, Pam Taylor from The Workstation Group, and James Weissman, kept more than 20 presentations moving at a rapid pace. The keynote session by Mike Cowlishaw, the creator of REXX and IBM Fellow from the IBM Hursley Labs in England, retraced the development and evolution of REXX since its first specification on March 29, 1979.

Other attendees of note included Anders Christensen from Norway, the Norwegian author of the Regina UNIX REXX interpreter, and Les Koehler, a former IBMer currently working with Advantis and credited with authoring some of the first REXX programs. The platforms that were represented by the Symposium speakers included UNIX, MVS and VM/CMS (IBM mainframes), and AREXX (Amiga), but it was clear that most of the interest centered on OS/2. The Rexx Language Association (RexxLA), whose goal is to spread the "gospel of REXX," also hosted their annual meeting on the first evening of the Symposium.

One of the most interesting topics was presented by Rick McGuire of the IBM Glendale Labs in Endicott, New York and the Object REXX development team leader. Rick's entertaining and easy-to-understand method of presentation generated keen interest. A beta version of Object REXX was made available to the OS/2 community for the first time on the IBM Developer Connection CD-ROM, Volume 6. Volume 7 of the DevCon CD-ROM contains an updated and improved version of Object REXX. The final beta is scheduled for Volume 8 of the DevCon CD-ROM. The power of Object REXX, which is becoming known simply as OREXX, is almost overwhelming. Those of us who have many years of experience with "classic REXX" (as the older style of REXX interpreter has come to be called), will have to adjust to the new concepts of OREXX and object programming in general. With OREXX, all of the variables and strings that we are accustomed to working with are one kind of object—a string object.

The Technical Development Committee for the ANSI X3J18 committee held its final meeting during the two days before the REXX Symposium. The members of this committee worked diligently for four years to produce the proposed ANSI standard for REXX. Although not many REXX users will be interested in pouring over this rather dry document, it will be available from numerous World Wide Web and ftp Internet sites around the world that include *http://www2.hursley.ibm .com* and *ftp.cfsrexx.com*. It will also be available in Library 6 of the OS2DF1 Forum on CompuServe.

IBM's announcement that the source code for their UNIX REXX interpreter will be available free of charge should also help spur new REXX development on the UNIX platform. IBM will also make a REXX interpreter available for Windows, but no comment was made on any fees that might accompany the Windows REXX interpreter.

IBM dropped a minor bombshell at the Symposium when Tim Browne of IBM's Glendale Labs in Endicott, informed the Symposium attendees that all of IBM's REXX development and support was being transferred to their facility in Böblingen, Germany. This announcement left many unanswered questions about the level of support and responsiveness that the German lab will provide for the OS/2 platform. The transfer includes OREXX, which is still in its infancy with its development tied to a Glendale Labs team that has been headed by Rick McGuire. Only time will tell what impact this major move will have on the future of REXX development. I doubt that the inadequacy of the REXX documentation will be improved by this transition, and that's a severe detriment to the expansion of OREXX that IBM is hoping for.

New REXX books

With the expanded interest in REXX by new OS/2 users, the non-technical question I have been getting most frequently is "What OS/2 REXX books do you recommend?" That has been a tough question until recently. Not that good REXX books haven't been written. Rather, previously available REXX books have been written with platforms other than OS/2 in mind.

During the Symposium I received two new OS/2 REXX books. The title of the first book I received was *The REXX Cookbook*, which reflects an approach that I have always thought would be ideal for presenting REXX to those who have just discovered it. Unfortunately, this cookbook only allows you to make hash. I found it very difficult to read because of its presentation and lack of organization. References jump forward and backward, and even an experienced REXX programmer might have trouble following the material as it is presented.

The second book, *Teach Yourself REXX in 21 Days* is the best OS/2 REXX learner's guide that I have seen. The

material is well organized and presented so that even those with very little programming experience can grasp it. Step by step, it leads the reader up to the manipulation of Workplace Shell objects with REXX. To avoid accusation of a biased recommendation, I should tell you that this book was written by Bill Schindler and one of my fellow contributing editors at *OS/2 Magazine*, Esther Schindler. It was also edited for technical accuracy by our own Brian Proffit. Collectively, in this writer's opinion, they did a great job of producing an OS/2 REXX teaching reference that is easy to read and that I highly recommend.

"Compile" or tokenize only

The REXX interpreter is mistakenly referred to as a compiler when it is actually an interpreter. When you invoke a REXX program by entering the name of the *.cmd* file on an OS/2 command line or by calling a *.cmd* file from another program, *cmd.exe* looks at the beginning of the *.cmd* file and determines that it is a REXX program by the presence of a comment (/*) in position 1 of line 1 of the *.cmd* file. When it finds a REXX program, it launches the REXX interpreter, passing it the name of the *.cmd* file.

The REXX interpreter then tokenizes or converts the REXX program to an internal notation and executes the program. This tokenized form of the program is saved as extended attributes of the program file and is available for subsequent execution of the program. By saving the tokenized format, subsequent execution is made quicker by eliminating the time required to convert the program statements to internal format. The extended attributes created by this process are:

```
REXX.METACONTROL
REXX.LITERALPOOL
REXX.VARIABLEBUF
REXX.TOKENSIMAGE
```

The maximum size for each extended attribute, imposed by the design of OS/2, is 64K. If a REXX program produces an extended attribute in excess of this 64K limit, the internal form of the program is not saved. Every time the program is executed, it must first be converted to internal format, which doesn't appear to pose any realistic hardship on the system.

It is possible to invoke the REXX interpreter to create the extended attributes without letting the program execute. The program is converted to the internal format, but not executed, by specifying the name of the *.cmd* file followed by **//t**.

Another gotcha

The **//t** command line parameter for *cmd.exe* demonstrates a serious flaw that I have reported to IBM and for which I have, as yet, not received a response. Any command line parameter that includes two concatenated slashes (//) is swallowed by *cmd.exe*. This flaw has a severe implication in trying to pass Internet Universal Resource Locators (URLs) to a REXX program. Because almost all of the URLs contain two slashes, for example *http://www.cfsrexx.com*, they will never be passed to the REXX program. I hope that IBM realizes the severity of this problem and releases a fix quickly.

Dick Goran is the author of the REXX Reference Summary Handbook, Third Edition. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, lib 6 on CompuServe or ftped from ftp.cfsrexx.com /pub. He can be reached via e-mail at 71154.2002@compuserve.com.

RESOURCES:

***Teach Yourself REXX in 21 Days* ($29.99)**
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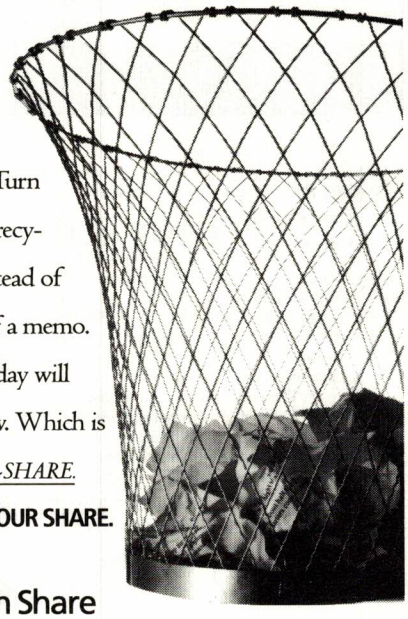

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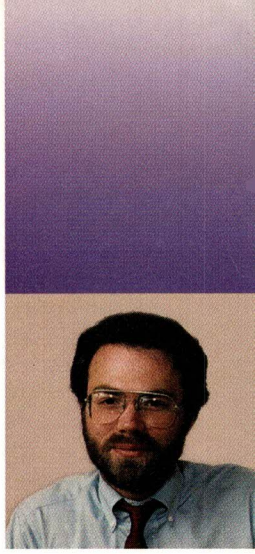

Cut the FAT

HPFS IS MUCH BETTER, BUT FAT IS STILL A SAFE BET. BY MARK MINASI

When you install OS/2, you have to make two big decisions: how to chop your drive into partitions and then into logical drives. When it comes to file systems, you are offered two choices: File Allocation Table (FAT) and High Performance File System (HPFS). These decisions can be somewhat major, and anyone who's struggled through OS/2 Warp's installation program is in no mood for big decisions, but they are important, so let's take a close look at them.

Choosing which file-system type to use depends on compatibility with DOS. Most people use FAT solely to make DOS happy. HPFS is superior in many ways to the FAT system, but most of us still use FAT for a very important reason: DOS recognizes it. Those of us who dual boot between OS/2 and DOS find that life is simplest if we use only FAT. DOS doesn't recognize HPFS-based volumes, so if you formatted your entire hard disk to HPFS, you wouldn't be able to dual boot DOS, because DOS wouldn't be able to see your hard disk.

Understand that, when I talk about DOS, I mean real genuine DOS, not the DOS emulator that is built into OS/2. The OS/2 DOS emulator can read HPFS just fine; so if you were to format your entire disk as HPFS and run only OS/2 on that disk, you'd be able to run DOS programs, but only under OS/2. Again, you'd lose the ability to keep DOS on the hard disk with OS/2.

The FAT system was first conceived in 1979 in an early version of Microsoft BASIC's file system. It seemed like an idea that was good enough to incorporate into DOS and it worked relatively well on floppy-disk-based systems. With large hard disks, however, it doesn't make quite as much sense. OS/2, therefore, offers HPFS as an alternative, and Windows NT offers its New Technology File System (NTFS). No doubt other operating systems will offer even more possibilities.

HPFS is superior in many ways to the FAT system, but most of us still use FAT for a very important reason: DOS recognizes it.

The FAT system is based on a series of linkages and has two main pieces: the directory structure and the FAT itself. Put briefly, the directory keeps track of any files you have on a disk and the FAT tells you where those files are.

Under the FAT system, all of the space that is used on the disk for data storage is grouped into areas known as clusters. You can find out how large the clusters are on your disk by running **CHKDSK.** It refers to the size of the allocation unit, which is another name for a "cluster" that first appeared in DOS 4.0 (although heaven knows why we needed another non-intuitive term). Cluster size is determined by the size of a logical—not physical—drive. Roughly speaking, clusters are 2K for logical drives up to 128MB, 4K for logical drives between 128 and 256MB, 8K for 256 to 512MB drives, and 16K apiece for logical drives that are sized from about 500MB up to a full gigabyte. You should use this information as a guideline when partitioning a new hard disk.

A cluster is the minimum amount of data space that can be allocated. If you create a small file—perhaps an ASCII file that contains a note that you wrote to yourself—and the file is no more than 400 bytes, how much space does it take up on the disk? If the disk is 100MB, it fits in the 2K cluster range. The minimum file size is, therefore, 2K, and the 400-byte file now has 2,048 bytes allocated to it. But, suppose you store the file on a disk that's 300MB with a 4K cluster. It takes 4,096 bytes to store that same 400 bytes. On one of those 1GB drives that are becoming so common, that 400 bytes would take up 16,384 bytes of disk storage.

What should you do about it? It's difficult to make a hard-and-fast rule about disk size versus partition size. If I assume that you're using a one-gigabyte drive, it's awfully convenient to just keep it as a single logical drive letter, *c:*. But then every file would take up at least 16K on the disk, leading to a lot of wasted space. One solution would be to use HPFS. One of HPFS's greatest benefits is that it only uses clusters of 512 bytes. In that case, my 400-byte file would only have 112/512 or about 20% wasted space, as compared to the 98% waste on a FAT-based file system with a single logical drive of 1GB and a resulting cluster size of 16,384 bytes.

Before I go any further, let me stem the flow of mail before it starts. Every time I've written about cluster size, someone e-mails me claiming that you

can adjust cluster size on a FAT disk (the writers never actually know how to do it, but they've heard that a way exists). Nothing of the kind exists—believe me—at least not within the confines of standard OS/2 disk types. One could, theoretically, define a drive format that resembled FAT in all ways, except for cluster size, and then implement such a drive. But it would require a special driver of some kind in *config.sys* or an Installable File System. You would also have the added problem of backward compatibility for DOS, requiring yet another device driver.

Since I mentioned HPFS, let me tell a quick success story. A couple of years ago, one of the servers on my network ran OS/2 LAN Server 2.0. I pressed the machine into service from its former life as a DOS machine, where it had run a DOS-based server product called LANTastic from Artisoft. Artisoft makes some truly easy-to-use small networking products, including the relatively new LANTastic for OS/2. (I will write about it one of these days but, for the moment, let me mention that LANTastic for OS/2 has been a great tool for connecting to our servers while we waited for OS/2 Warp Connect to appear; it's completely OS/2 Warp-ready.)

Anyway, the LANTastic server had a 1.7GB drive on it, formatted (naturally) in the FAT format. I didn't mention it before, but logical drives between 1GB and 2GB create cluster sizes of 32,768 bytes—32K. Yes, it was massively inefficient, but it was also quick to set up and totally trouble-free. I promised myself that I'd get around to installing an industrial-strength server some day. That day came when I popped LAN Server on the machine. LAN Server, of course, ran faster than LANTastic, but that was no surprise: it used protected mode, all the PC's memory, and so on; whereas the LANTastic server was intended for real mode.

I hadn't expected that when the server was formatted with FAT. Our data on the server took up 1.1GB of space. When we reformatted under HPFS, only 800MB of the server disk was filled. I double and triple checked to make sure that something hadn't been zapped on the disk, but nothing had been lost. If anything, the disk held more data than before, as LANTastic is quite slim compared to LAN Server. That's a tangible benefit from a more efficient file system. (This statement shouldn't be read as an endorsement of LAN Server at LANTastic's expense. It's not. I've always found the LANTastic software easy to set up and control, and I recommend it to anyone who is assembling a small LAN.)

I seem to be arguing in favor of HPFS or FAT with small logical drives. But it's good to stay with the simple model of one logical drive and FAT/DOS compatibility. One logical drive means simpler management. You'll only have one drive to back up and one drive to search when looking for things. Multiple logical drives may require shuffling data back and forth among them to get enough space in one place to load the latest version of the C++ compiler and library.

However you arrange your disk, be careful while you're doing it. Changing partition sizes destroys data on a disk. Whenever you change partitions, you have to back up the drives that are involved in the change, blow away the drives, repartition, and restore the data—which has generally been an afternoon's work until a recent development.

That new development is PartitionMagic, a tool that converts FAT to HPFS and changes partition sizes without losing data. PartitionMagic was reviewed in Test Drives, July 1995, p. 17.

Mark Minasi has been a consultant and educator in the fields of advanced PC operating platforms and PC technology since 1984. He is a contributing editor for Compute, BYTE, and OS/2 Magazine. You can contact him at CompuServe 71571,264 or Internet mark@smtphost.mmco.com.

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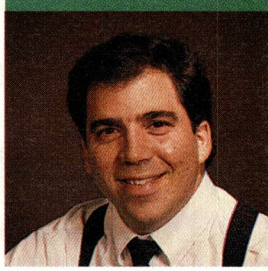

RECREATING THE SPOOLER, FINDING OS/2, DEFRAGMENTING DRIVES, AND MORE...

BY DAVID REICH

MEMORY REQUIREMENTS FOR WINDOWS PROGRAMS

Q: I know that Windows (on plain DOS) needs approximately 8MB RAM to work well. So, under OS/2 Warp, do I need to set the XMS-memory limit in the DOS Settings of each Windows application to 8MB? Is the 2MB default setting enough for general applications, such as AmiPro 3.0, Lotus 1-2-3 R4, and so on?

A: Depending on the amount of memory your applications use, OS/2 will set up the XMS-memory limit for you. In general, Windows (Win-OS/2) uses DOS-Protected-Mode-Interface (DPMI) memory. The system establishes the default DPMI-memory-limit setting for individual DOS sessions (VDMs) at 64MB and it is allocated dynamically, as needed, by Win-OS/2 and the application, up to the Windows-imposed maximum of 64MB. So, you should not have to bother changing any settings for your Win-OS/2 sessions; the system will handle the memory allocation for you.

However, if your applications state that they require XMS memory, you will need to make the appropriate change to the XMS memory DOS setting for that session.

CAN'T FIND \OS2

Q: When I open the Drives object for my *c:* drive, I can't see the *\os2* directory or folder. I can open a command prompt, change to the *\os2* directory, and look at it, but I can't see it in the Drives folder.

A: Your problem could have several causes. The hidden attribute might be set on that directory. If that's the case, you can change to the directory with the command prompt, but you won't be able to see it in the drives folder. This problem can be fixed by turning off the hidden attribute on the directory, or by changing the Include criteria on the Drives object.

To change the attribute, open a command prompt and make sure it's set to the root of your *c:* drive. Type:

```
ATTRIB -h os2  <enter>
```

which will turn off the hidden attribute. Now, open the *c:* drive object and check to see if the folder is visible.

You can also change the Include criteria for the folder. To do so, open the Settings Notebook for the *c:* drive object by pulling down the context menu with a right-click on the object. Select Settings with a left-click. Select the Include page with the left button and select the Change button. Where you see the Comparison value, left-click at the H until you see a dash (-). Click on Change and close the notebook. This approach will also fix the problem if the hidden attribute is set on the object.

The other possibility is that some corruption has occurred in the attributes for that drive object. To correct this problem, open a command prompt and ensure that you are in the root directory of the drive. You will find a file called *wp root. sf* (**WP_ROOT._SF** on FAT drives) that contains the drive object's attributes. This procedure will reset all customization that you may have done on the Drive object, but it should correct any problems you may be seeing. First, make sure you close the Drives object. Then, delete the *wp root. sf* file on the drive that is having the problem. Because attributes are set on this file to protect it, you will have to remove them. To do so, type:

```
ATTRIB -h -s -a -r WP ROOT.
SF  <enter>
```

If you are on a FAT drive, make sure to use **WP_ROOT._SF** in this command.

After you remove the attributes from the *wp root* file, open the Drives object. The problem should be fixed.

DEFRAGGING

Q: Is there a safe way to defragment an OS/2 drive? If so, what software would you recommend?

A: HPFS drives do not have to be defragmented. One of the primary objectives of the High Performance File System is to minimize fragmentation. If it can be done, HPFS will have done it already. If you have a FAT drive, some third-party utilities work well. Norton's Speed Disk, for example, usually does a good job and does not blow up extended attributes.

The biggest problem with disk defragmenters is the extended attributes on FAT drives. OS/2 uses several unused bytes in the FAT directory structure to store extended attributes and point to the appropriate place in the *ea data. sf* file on the FAT drive. If the disk defragmenter moves directories and ignores the unused bytes of the FAT entry, the attributes may become corrupted. Most defragmenters work well, but you should take care.

Instead of defragmenting the drive

with a defragmenting program, you can also back up the drive, format it, and restore it. The backup and restore is not a bit-for-bit copy to an identical image. It is, essentially, a file copy. A format and restore will simply copy the files back to an empty drive, effectively defragmenting the drive. XCOPY also works well here.

READING RMVIEW'S OUTPUT

Q: Your information about RMVIEW (January and February 1995) was very helpful. How do I display it page by page, or capture the text to a file? When I use the command, it usually scrolls the information so fast that I can't even read it.

A: There are a few ways you can capture the output from **RMVIEW** or from any command that scrolls data very quickly. You can try to hit the <Pause> key quickly enough to stop and read it, but most people are not that fast and this technique can get old quite quickly. Two other options include piping the output to the **MORE** program, or redirecting the output to a file.

Piping the output to **MORE** will stop the display from scrolling when the screen or window is full. It won't resume scrolling until a key is pressed, allowing you to read the output screen by screen. Type:

```
RMVIEW | MORE
```

When you see the **MORE** indicator at the bottom of the screen, press any key to resume scrolling. The | character is the pipe, which tells the program (**RMVIEW** in this case) to send the output to another program, in this case, **MORE**.

To redirect the output to a file, type:

```
RMVIEW > rmview.out
```

You can then edit it with a text editor. The > character is the redirection character that forces the output of the program (*RMVIEW*) to some place other than the screen. This place could be a device (you could use LPT1) or a file, which in this case is *rmview.out*. The file can then be edited or browsed with another tool.

WINDOWS APPLICATIONS AND THE WORKPLACE SHELL

Q: I am unable to make the drag-and-drop capabilities of the Workplace Shell work with Microsoft Word for Windows or any other non-OS/2 word processor. I want to type a document and drag it to the printer to print, but all I get is a lot of garble.

A: The problem stems from the fact that Windows applications are not designed to work with OS/2's drag-and-drop functions or the Workplace Shell. Some non-OS/2 applications, such as the Workplace Shell extensions for WordPerfect 6.0, are available but, by and large, non-OS/2 applications will only print from within the application.

The application must be able to set up document objects for its data files or store its data files as plain text or printer-specific files. The shell's drag-and-drop printing, without any custom object classes from applications, is only able to print plain-text or printer-specific files. The applications that create the data files or documents must be Workplace Shell-aware to have complete drag-and-drop printing capability.

WINDOWS MULTITASKING

Q: I don't seem to get the full benefits of OS/2, such as multitasking, when I run Windows applications. For example: I use WordPerfect 5.2 for Windows (running in a separate session) and when I print, I wait a long time for the job to finish and the hourglass pointer to disappear before I can work on my document. I should be able to return to my work almost immediately while the document prints in the background. The main reason I bought OS/2 was to avoid waiting, but I am no better off with OS/2 than I was when I only ran Windows.

A: I'm sorry to burst your bubble, but OS/2 can't overcome all of the DOS and Windows limitations. OS/2 is indeed multithreaded and multitasking. Each program is, at a minimum, one thread of execution. Every thread can be multitasked with many others. Native OS/2 applications can use many threads, each running a piece of a program. This type of application can run one piece, such as printing, while other pieces run concurrently.

DOS and Windows applications, however, do not include that functionality. They are not multithreaded applications. Each DOS/Windows application is one thread of execution. So, while you can run many applications simultaneously, DOS and Windows applications can do only one thing at a time. Waiting for WordPerfect to finish printing before you can do anything else is a limitation of the application—not OS/2. OS/2 native applications, such as DeScribe or AmiPro, can do exactly what you are asking for, because they are multithreaded applications.

You should also realize that, in any application that prints, even on a separate thread, you will have to wait until the print job is spooled, because you shouldn't be printing something while changing it. True native OS/2 multithreaded applications can print much more smoothly and speedily than Windows programs.

THE UNDELETABLE

Q: How can I delete undeletable objects?

A: I get asked this question quite often. Undeletable objects can be set up several ways. Because the Workplace Shell represents objects in the system, some are files on the disk and others are objects that exist only in the *.ini* files and extended attributes. Deleting things marked undeletable can be a challenge. No one set of steps will always work, so each time I come across new ones, I put them in this column. This one was sent to me by Hal Director.

You can open the object's context menu by right-clicking on it and selecting Move. You can then either select PATH or DRIVES and choose a floppy drive (make sure you have a floppy in the drive). OS/2 will allow you to move most objects to a floppy drive. After moving the object, simply reformat the floppy.

Listing 1:

```
/* File used by MAKEINI.EXE to recreate the spooler object in OS2.INI */
CODEPAGE 850
STRINGTABLE
BEGIN
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "PM_InstallObject" "Spooler;WPSpool;<WP_CONFIG>" "OBJECTID=<WP_SPOOL>"
END
```

RECREATING THE SPOOLER

Q: I accidentally deleted my spooler object from the System Setup folder. How can I get it back?

A: You will have to recreate this entry in the OS/2 *.ini* files. To do so, you'll have to do a little editing on a file. Look in your boot drive's *\os2* directory for a file named *ini.rc*. Copy it to a new file name, called *spooler.rc*. Edit it so that it reads as shown in Listing 1. (The "" indicates a pair of double quotation marks.)

Once you are finished with that file, open an OS/2 Windowed command prompt and type:

```
MAKEINI OS2.INI
SPOOLER.RC
```

When the operation is done, shut down your system. When you reboot, you should find a spooler object in your System Setup folder. You can use this method to recreate any of the objects that are created at installation time if you lose or delete them.

David Reich, a contributing editor to OS/2 Magazine and author of Designing High-Performance OS/2 Warp Applications, has been with the OS/2 development team since 1987. David is interested in your questions and suggestions. Contact him at CompuServe 76711,632 or Internet speedracer@bocaraton.ibm.com.

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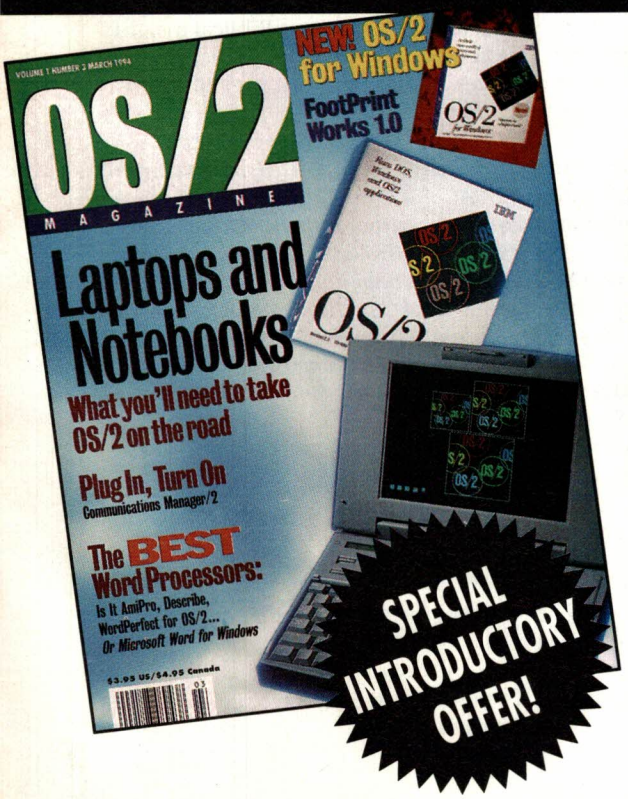
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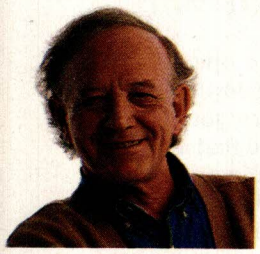

In The Good Book...

MASTERING OS/2 WARP—THE OS/2 WARP BIBLE.

BY STAN KELLY-BOOTLE

Another encyclopedic OS/2 Warp book hits the shelves with a pleasant thud: *Mastering OS/2 Warp—the OS/2 Bible* from Sybex, which is written by Peter Dyson with help from Gene Weisskopf, who contributed the IBM Works chapters. It's a heavy tome, not only in the avoirdupois environment (1,245 pages, weighing in at over five pounds), but also in its exhaustive and authoritative coverage. Whether the latter justifies the biblical subtitle, though, is a moot point. Some readers might be offended by the implied claims of divine inspiration and inerrancy. I hasten to add, from personal experience, that authors are blameless: all book-title and blurbage sins must be laid at the door of the marketeers.

I like the look'n'feel of this book. With so much daunting detail to cover as OS/2 expands into the multimedia and networking arenas, Sybex served the authors well with lots of legible windows, handy chapter tags, excellent indexing, and diverse typographical tricks to aid your navigation.

The two leading rivals to *Mastering OS/2 Warp* seem to be *Unleash the Power of OS/2—Warp Edition* (David Moskowitz and David Kerr, Sams) and *Inside OS/2 Warp, Version 3* (Mark Minasi et al, New Riders Publishing). It's a close call. All three books include a CD-ROM and creep in under the $40 barrier by a risible whisker. It would be fun to encounter an OS/2 book that sold for $40.01 or $40.05, but Laws is Laws: the physicists have their *c* (the velocity of light), and publishers have their $40.

Mastering OS/2 Warp really scores in the quality of the free bonus CD-ROM. Sybex includes the August 1994 version of the justly-renowned Hobbes OS/2 Archived CD-ROM from Walnut Creek CDROM (Concord, Calif.) that retails for $29.95. A Hobbes update subcription deal for $19.95 per quarter is also available. This varied collection of more than 3,000 files (utilities, drivers, fonts, icons, games, and more) gained an *OS/2 Magazine* Editor's Choice Award last year.

If you build your OS on a rock, "...the Gates of hell shall not prevail against it." (Matt. 16:18)

All three books offer comparable technical expositions. Moskowitz and Minasi, perhaps, have the edge in what I might call OS/2 evangelical fervor. Dyson (as befits a fellow Brit) writes impeccably, but with a slightly stiff upper-lip: "Part of OS/2's universal appeal is that..." Dyson's "Bible," it seems, assumes that the reader is already converted (like IBM's Slavic nuns) while Moskowitz and Minasi appear ready to coax the heathen with fire and brimstone.

I am pleasantly shocked that I have already completed my first year of endnoting for *OS/2 Magazine*. *Tempus* really does *fugit* with such labors of love, and I want to thank Editor-in-Chief Alan Zeichick, Associate Editor Alexander Antoniades, and Copy/ Production Editor Anne Mellinger for their amiable support.

Likewise, may I thank all the readers who have e-mailed their comments, mainly favorable and always welcome. I look forward to many more years, Big Blue permitting, of OS/2 columny. The OS/2 obituaries continue to prove as exaggerated as Microsloth's Win95 delivery promises. And the *khútspe* of Brad Silverberg, the Microsoft Windows VP, still defies historical analysis:

"OS/2 is a cheap imitation of the next Windows release. They've basically taken what we've announced and said 'me too.' It's a product without a vision from a company without a vision." (Interview in *The Wall Street Journal*, October 10, 1994.)

I'll leave you with a Biblical insight: If you build your OS on a rock, "...the Gates of hell shall not prevail against it." (Matt. 16:18)

Stan Kelly-Bootle started computing on EDSAC I at Cambridge over 40 years ago and has written at least 11 books. His "Devil's Advocate" column in UNIX Review has been running since 1984. His latest book is The Computer Contradictionary from the MIT Press. He welcomes e-mail via CompuServe 70323,1560 or Internet skb@crl.com.

RESOURCE:

Mastering OS/2 Warp- The OS/2 Warp Bible
($39.99 including the Hobbes OS/2 Archived CD-ROM)
by Peter Dyson
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